

METAL PRODUCTS MANUFACTURING

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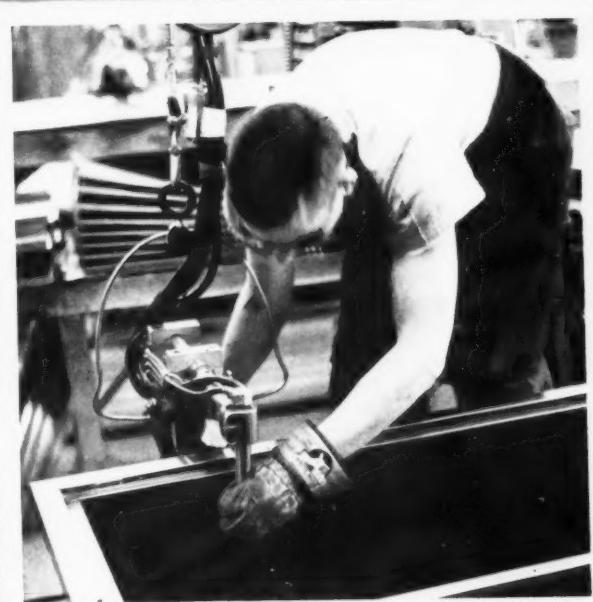
TECHNOLOGY
DEPARTMENT

Vol. 18

M P M

Serving the Appliance and
Fabricated Metal Products Industry

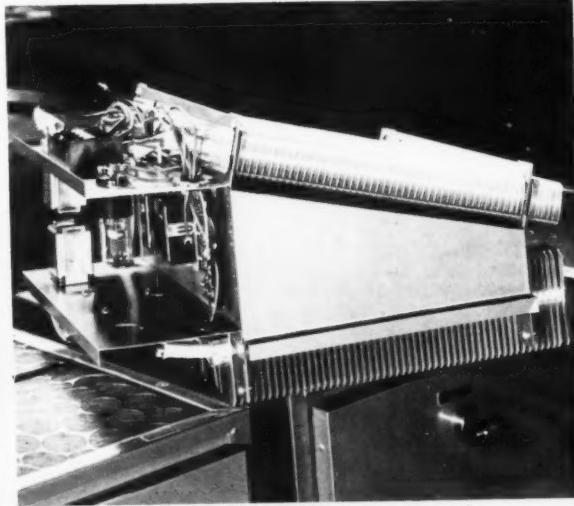
AUGUST 1961



Welding "Monster" Gives St. Charles Efficiency, Versatility — Page 44



Caloric Reveals "Dualaire" Air Flow System — Page 28



A Compact Electric Furnace for Mobile Homes — Page 49

TLC* dryer control is TIMER-less...and TROUBLE-less

Just set the dryness
and
FORGET THE TIMER

... because there is no timer in Robertshaw's TLC* dryer control system. And this means there is no timer to set, service, adjust or get out of whack!

TLC control means TIMER-less control . . . TROUBLE-less control . . . and tender, loving care for even the daintiest things. Yes . . . just set the dryness and forget the timer . . . Robertshaw's TLC dryer control does all the rest. Any size load, any fabric and any mix is dried exactly as desired . . . and even gently fan-cooled. No more under-drying . . . no more over-drying . . . and all the problems of timer-type dryer controls are eliminated.

Want more details? Write to Department MP, Robertshaw Thermostat Division, Robertshaw-Fulton Controls Company, Youngwood, Pennsylvania. Canadian Affiliate: Robertshaw-Fulton Controls Company, Limited, Toronto.

VMA 9126



Robertshaw 

... the name that MEANS temperature control

*Trade Mark — Robertshaw TIMER-less control system for any dryer
(available on 1962 dryers)

Circle No. 349 on Reader Service Card.



Capitalize on high customer acceptance
of steel; put the distinctive Steelmark
on the products you make.



New steels are
born at
Armco

Armco ZINCGRIP Steel---Low-Cost Corrosion Protection For Dryer Drums

Little boys' trousers are made of denim and brads . . . yes, and pockets full of interesting paraphernalia that can be rough on dryer drums. But you can relieve Mom's washday anxiety by equipping your dryers with drums made of durable Armco ZINCGRIP® Steel.

The coating on this special steel won't chip or peel . . . either in service or during fabrication. The tightly adhering coating is applied by the continuous hot-dip method, developed and perfected by Armco Research.

Give your products the sales advantage of drums that have the low-cost corrosion protection of ZINCGRIP Steel. For complete information, write Armco Steel Corporation, 1851 Curtis Street, Middletown, Ohio.



Armco Division

Circle No. 305 on Reader Service Card.



Add your
company name
to this list of
great names
in the metal-working
world who use
Kerns products

Aerojet General
American Motors Corp.
American Steel & Wire
Borg Warner Corp.
Bridgeport Brass Co.
Briggs & Stratton
Buick
J. I. Case Co.
Caterpillar Tractor
Chase Brass & Copper
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Hotpoint
IHC
Kaiser Industries
Keystone Steel & Wire
Lockheed Aircraft
Maytag
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Northwestern Steel & Wire
Olin Mathieson Chemical
Pittsburgh Plate Glass
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Remington Rand
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Reynolds Metals
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SKF Industries Inc.
U.S. Steel Corp.
Western Electric
Whirlpool Corp.
Wyman Gordon
Youngstown Sheet & Tube

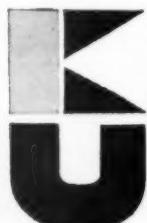
KERNS INDUSTRIAL LUBRICANTS PROVE THEMSELVES AT NO COST TO YOU!

Improved production, maximum machine efficiency, and lower maintenance costs are vital to increased profits. A lubricant . . . the best for your purpose . . . is available for an actual production test run without cost. Kerns United, under their Memo Billing Trial Basis, recommends and supplies a lubricant for testing in your own plant . . . no formal invoice will be rendered unless completely approved in production.

Consult Kerns United now! Get the advantages of a product formulated to blend with *your own operations*.

Manufacturers of Cutting, Grinding, Drawing, Forging, Phosphatizing, Cleaning, Rope, Twine, Wire Drawing and Spray Booth Compounds; Cling Oils, Rolling Oils, Rust Preventives and Specialized Greases.

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World's Largest Exclusive Manufacturer of Specialized Industrial Lubricants

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Offices in Principal Cities throughout the U.S.A.*

Circle No. 323 on Reader Service Card.

AUGUST • 1961

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METAL PRODUCTS MANUFACTURING

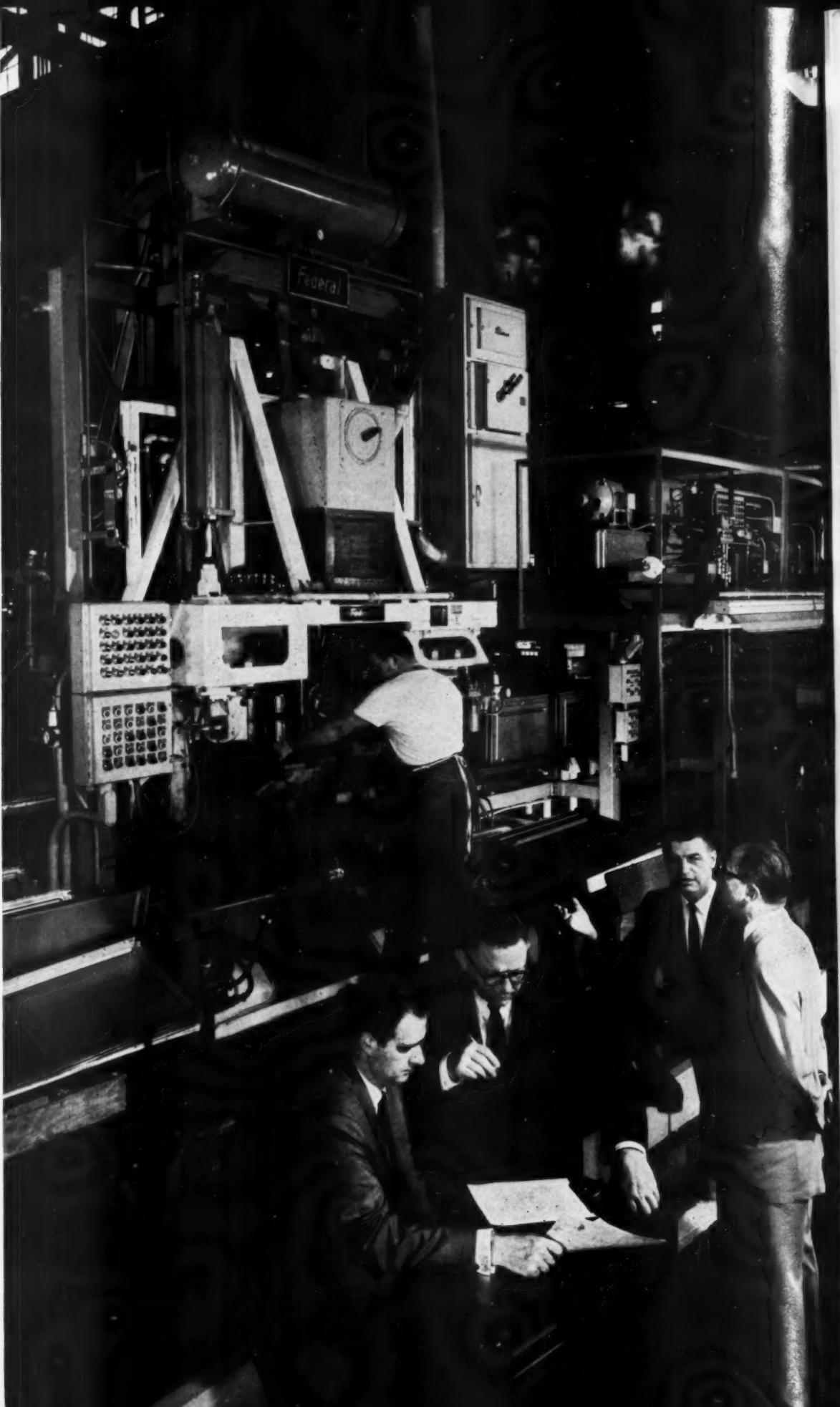
FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, sales management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is \$10.00 per year, domestic. To all other countries \$15.00 per year (U.S. funds). Single copies, \$1.00.

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Federal Welding Line at Whirlpool's Evansville, Indiana, refrigerator plant automatically forms and welds together complete food liner shells at a rate of 200 per hour. Here, F. A. Bodenheimer, Jr., manager of welder sales for McKay's Federal-Warco Division, goes over latest production charts with H. J. Muehlbauer, director of manufacturing engineering for Whirlpool, as Robert Bussell, sales representative for Federal-Warco, discusses operations with Gene Rommel, general superintendent of tooling for Whirlpool.

A completely integrated plant . . . a single source of supply . . . one area of responsibility! A new idea? Not really, but an idea that's not easy to bring to reality. McKay Machine has done it for metal fabricators, designing and building equipment to volume produce parts or entire units from raw steel to finished product.

This is **McKay Machine**

We know steel handling . . . we've been designing uncoilers and coil-handling equipment for 30 years. McKay Machine knows welding because the highly respected names of Federal Welder and Berkeley-Davis are now a part of our company. We know processing and forming . . . McKay levelers, tube mills, and cold roll forming machines have been specified by leading industrial firms for more than two decades. And McKay Machine knows stamping, as the Warco Press name testifies. McKay builds the industry's most popular shearing and slitting equipment. Only McKay Machine designs and builds all the components for a truly integrated production line. If you are one of the hundreds of manufacturers who must shave production and handling costs to successfully compete, McKay Machine should interest you. If we do, let us know and we'll meet with you at your convenience.

The McKay Machine Company, Youngstown 1, Ohio.



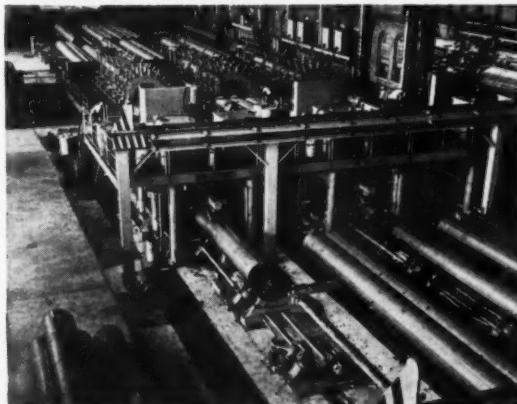
Circle No. 331 on Reader Service Card.



McKay Tube Mills and roll forming machines are considered among the best engineered in the world.



Warco Presses can be found in the leading automotive, appliance and aircraft plants . . . wherever stamping is a major operation.



Berkeley-Davis Fusion Welding Lines, such as the huge installation above, are used by an ever-increasing number of leading steel fabricators.

8 YEARS OF CONSUMER TESTING

prove the superior
Corrosive resistant qualities
of Ing-Rich Frits for

GLASS LINED WATER HEATERS

Many thousands of glass lined water heaters, produced with Ing-Rich FRITS, have been in service over an 8-year period . . . and our FRIT customers report a *complete absence* of "field trouble." Satisfied CONSUMERS are surely the most convincing proof.

there is no substitute for proven performance

We will welcome the opportunity of supplying you with plant tested and field tested frits which will provide:

1. Greater corrosive resistance
2. Less porosity
3. Higher percentage of one coat applications
4. Wider range of firing temperatures
5. More workability
6. Much greater acid resistance

INGRAM-RICHARDSON, INC.

OFFICES, LABORATORY AND PLANT • FRANKFORT, INDIANA



Pioneer Producer of
LIFETIME
Porcelain Enamel Products

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THE FINISH LINE

MPM

REFRIGERATION

Freeze-drying . . . gets new impetus from an attractive, four-color, interesting and informative advertisement in a recent issue of *Fortune* for the Grocery Products Div., Armour & Co.

The advertisement leads off with the following copy:

"Less than twenty minutes before they were photographed, these boneless center-cut pork chops {mouth-watering in the ad} were on a cupboard shelf, sealed in an airtight aluminum foil bag. They weighed one ounce apiece."

"The chops were placed in a dish of cold water. Fifteen minutes later they went into the frying pan weighing four ounces each. In a moment or two they'll be ready to eat and they'll taste exactly like fresh chops — tender, succulent."

"Pork chops are one of Armour's amazing new freeze-dried foods that can be kept indefinitely without refrigeration. Steak, scrambled eggs, well-seasoned chicken and vegetable combinations, and hearty beef stew are among the tempting Star Lite freeze-dried dishes Armour now has available for campers, hunters, fishermen, and the like."

"Coming soon will be a variety of products for home use . . ."

In addition to direct-selling copy, the Armour advertisement gives a brief but clear description of the freeze-drying process for the benefit of the uninitiated.

Should there remain any refrigerator manufacturers who have viewed accelerated freeze-drying as a process to be considered in the distant future or as a subject to whet the appetites of magazine editors, this type of forceful promotion by Armour & Co. should alter their thinking quickly.

Thin-wall refrigerators . . . have been presented by this and other publications as one of the worthwhile forward steps to give the user greatly increased refrigerator capacity without increasing the requirement for kitchen floor space. To get 18 cu ft of usable refrigeration space in a unit that requires only the floor space of an older, 14 cu ft model, would indeed seem to be a step forward.

Like most innovations, however, there is always another side to the story. Currently there appears to be a "psychological block" affecting the sale of thin-wall type refrigerators. Apparently the buyer still considers size and weight as factors to be considered and some, at least, have the feeling that a refrigerator, requiring no more floor space than an earlier model, should be similarly priced — a viewpoint which is obviously unsound.

HOME LAUNDRY

Back to conventionals . . . may be a possibility if not a probability in the home laundry industry.

A recent published report states that GE might "go back" to selling wringer washers, and that the company is test marketing wringer-type units and querying sales outlets on their current interest.

We know of at least three individual cases where families in the medium to high income brackets tossed out automatic

washers in favor of a return to conventionals. The principal reason given was frequent, high-cost, and unsatisfactory service on automatics.

The bright side of this picture is the increased attention given to the serviceman's interests in new designs by leading producers. (See "Serviceman 'Honored' in Design of Westinghouse Automatic Washer," March 1961 MPM.)

At a recent press conference featuring new Norge home laundry equipment, Chairman of the Board Sayre and Vice President Bull gave first attention to the ease of servicing or, as Norge calls it, "Service-Simple," designed into the new automatic washer.

Such increased attention to service requirements with respect to time and cost, plus increased attention to reliability, can do much to keep the automatic in the relative position it deserves.

NEMA

The National Electrical Manufacturers Association has taken a positive step in relation to compliance with antitrust laws and general good business conduct.

The NEMA Board of Governors, at a meeting on June 20, adopted a "Statement of Principles," which it suggests as a guide to electrical manufacturers in connection with compliance with antitrust laws.

The statement embodies seven principles offered as "sound guide posts" for observance by individual companies. At the same time the board presented a reaffirmation of the principles governing the conduct of NEMA affairs. The statement is intended to be broad enough to assist individual companies, both within and outside the electrical manufacturing industry — "to observe those tenets of good business conduct which the law requires and those which are dictated by reasonable standards of ethics and morality."

The NEMA board plans to distribute the statement of principles to members of NEMA and to all other electrical manufacturers, with the recommendation that they be adopted and supported.

GAMA

The Gas Appliance Manufacturers Association's General Business Outlook report for the second half of 1961, by Edward R. Martin, director marketing, reports a consensus that the aggregate of the 1961 second half sales of gas appliances and equipment will be 18.5 percent above the first half, and 1.2 percent above the second half of 1960.

The report also states: "In analyzing the actual sales figures for the first five months of 1961, particularly for the month of May, there appear strong indications that the sales climate for gas appliances and equipment is showing initial signs of improving."

Dane Chase
EDITOR AND PUBLISHER

Starting today,
all
gas ovens
are
obsolete

1961
JUNE
5 MONDAY

As surely as the diesel put the steam engine out to pasture, the new Wilcolator oven control obsoletes even the industry's newest models.

First demonstrated on June 5 of this year, the new Wilcolator control has already earned wide acclaim as the most dramatic single development in gas oven cooking since Wilcolator's invention of the remote bulb thermostat, 25 years ago.

Programmed cooking

Wilcolator's new oven control is a fresh new concept: it makes *programmed cooking in a gas oven* come true. The Wilcolator control lets the homemaker schedule cooking by stages, with just one setting. She can go shopping, or to work, or out for a Sunday drive with the family while a beef roast

- thaws* and cooks
- cooks and holds*
- or thaws, cooks and holds

More features . . . for less money

The heat stepdown from cooking to warming temperature* is accelerated by an optional "gourmet fan" located to provide rapid cooling of the oven. A panel light shows the homemaker when the oven is on; another tells her when a pre-selected temperature has been reached. Close control over temperature is another feature: cycling on the new Wilcolator control temperature graph shows an excellent amplitude pattern. And with the Wilcolator control there is no critical re-ignition problem. Relighting can be accomplished at the pilot or main burner, as the manufacturer chooses. In addition, 100% safety shutoff can be supplied. Finally—and in direct contrast to the

control industry's pricing trend of recent years—the whole Wilcolator control package actually *saves* the manufacturer money, offering more features at a substantial dollars saving. We will demonstrate just how and why this saving can be offered.

When?

This remarkable departure in gas oven control is ready now. Manufacturers who have seen it have already projected the new Wilcolator control into their 1962 ranges. Unquestionably, it is already well on its way to revolutionizing the gas oven industry.

You owe yourself a look at the Wilcolator control in action. See it—simply write, phone or wire Wilcolator.

*Warming temperature ranges down to and below 138°F, as your home economist advises.



THE WILCOLATOR COMPANY
1001 NEWARK AVE., ELIZABETH, N.J.

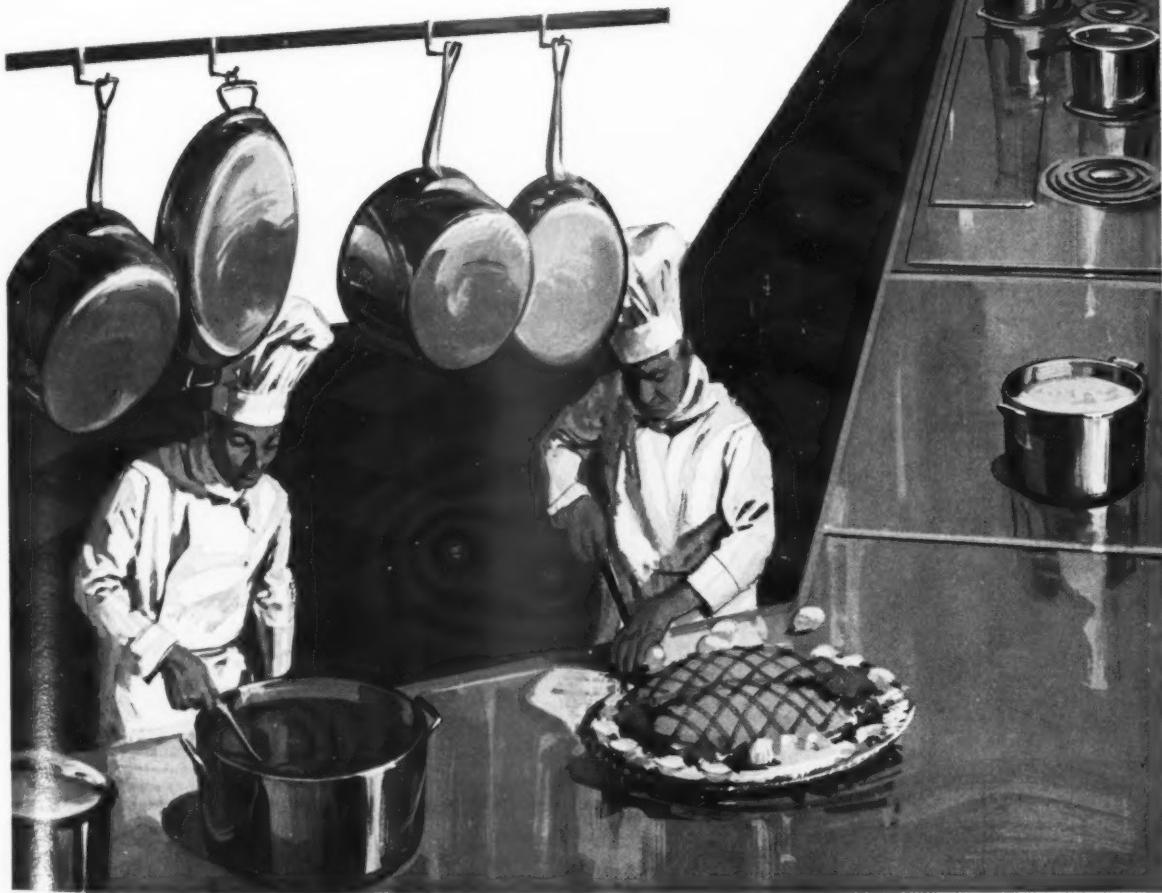
Thermostats for Every Heating and Cooling Application
Subsidiaries and/or affiliates in
Canada, Great Britain, Italy, Western Germany, and Australia

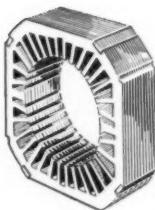
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good taste
in stainless steel

McLOUTH
STAINLESS
STEEL—the CLEAN metal
for kitchens and food handling.

*McLouth Steel Corporation
Detroit 17, Michigan*





REMARKABLE NEW STATOR INSULATION SYSTEM uses bonded Alkanex® powder. Gives better insulating properties without paper or film in slots. Allows irregular slot arrangements for greater design flexibility, smaller motor, more torque from same-size stator. Available now on two-speed appliance motors. A new demonstration of General Electric's leadership in appliance motors.

746-01



General Electric announces ...
**NEW TWO-SPEED APPLIANCE MOTOR
WITH INTEGRAL INSULATION**

Progress Is Our Most Important Product

GENERAL  **ELECTRIC**

Circle No. 315 on Reader Service Card.

MPM

newsquotes

Up to 40 percent of the service calls made by the appliance industry, including those made during the warranty period, are caused by customers not following instructions.—Mrs. Arleen Arnold, Kelvinator.

It is our belief that a system of free enterprise can survive in this country only so long as the products of industry are priced fairly and competitively. That principle has been at the bottom of the association's vigorous and faithful observance of the laws.—NEMA.

During 1961 many aggressive marketers will make substantial progress, both as a result of their own vigorous efforts and also in some cases because their competitors have decided to "pull in their horns" and await the return of more favorable conditions.—G. D. Crain, Jr., Advertising Publications.

Complete cooperation between component manufacturers and end product manufacturers is required if adequate reliability goals and adequate field failure analyses are to become a reality on all control components.—R. L. Heckman, General Electric.

The resurgence of the steel industry thus far in 1961 . . . must be confounding any "doubting Thomases" who have been skeptical about the outlook. It should now be clear to all that steel will continue to hold its place as the leading material of our modern civilization.—Joseph L. Block, Inland Steel.

We don't believe in "Buy America" any more than we believe in "Buy Swiss." If the friendly nations of the free world, led by the United States, can't do business together we are all going to be in a very bad position when we are forced to meet real trade pressure from Russia and the other communist nations.—Paul R. Sidler, Brown Boveri Corp. (U.S. subsidiary of a world-wide manufacturing organization headquartered in Switzerland).

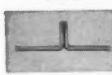
The greatest problem an innovator has is to anticipate and deal with unconscious resistance.—Marv Fuller, Whirlpool.

In our own country we speak of "the economy" as if it were a machine and we chart its "growth" in dollars of "gross national product," which are as fictional in meaning as they are diluted in real value by inflation. We ignore the reality that the economy is not products — it is people — and economics is not statistics but rather the material manifestation of human action and the satisfactions underlying freedom of choice.—Bay E. Estes, Jr., U.S. Steel.

Arvin has added new wide coil facilities—48" and over—to its narrow coil and sheet facilities. This addition makes Arvin the only source for coil and sheet laminates as well as fabricated Arvin stampings and assemblies.

NEW ARVIN WELDING TECHNIQUES

Body Joint Welds
High Production
Speeds



Exterior surface of vinyl unmarred by weld. Vinyl doesn't have to be ground sway before welding!



An excellent weld when assembly of trim or other component parts hide the point of welding.

- 150 Custom patterns in any quantity
- Complete fabrication & assembly facilities
- Single color 8/Mil Vinyls at reduced prices
- New weatherproof Vinyls now available
- Bright metalized patterns for trim areas
- New wood laminates for cabinetry & panelling available in lock-seam tubing and roll-form shapes
- Rigidized expanded & perforated laminates
- Complete design and prototype service



America's
largest vinyl
metal laminator

© ARVIN INDUSTRIES, INC. • Columbus, Indiana
Arvin Division

NEW COATING CONTAINING GEON VINYL PUTS MORE PROTECTION ON METAL

"Freight Liner 510" protective coating is manufactured using Geon solution resins by Archer-Daniels-Midland Company, Minneapolis. B.F. Goodrich Chemical Company supplies the Geon vinyl.

B.F.Goodrich

The manufacturer of this coating for freight cars calls it "a tough, permanently elastic, non-porous plastic coating that protects exterior surfaces as no other coating material will". It is made using Geon vinyl solution resins.

There's reason for the confidence. Look at what tests have proved: two passes of pure silica sand blasted against the surface at 100 psi cut through ordinary paint to bare steel, whereas it only dulled the surface of the paint made with Geon. Geon is tough. Over 500 hours of salt spray corrosion testing had little effect on the new paint. Geon is corrosion resistant—the coating is prac-

tically unaffected by salt air corrosion, spillage from corrosive ladings, or atmospheric chemicals.

In addition, Geon provides extra weather-resistance. Exposed to over 2000 hours of accelerated weathering tests, the coating exhibited excellent color and gloss retention. There is no curling, flaking, checking or cracking.

Results like this are reasons so many manufacturers are using Geon vinyl in so many forms—as coatings, extrusions, moldings, or in rigid form. For more information, write Dept. NB-6, B.F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland 15, O. In Canada: Kitchener, Ont.

B.F.Goodrich Chemical

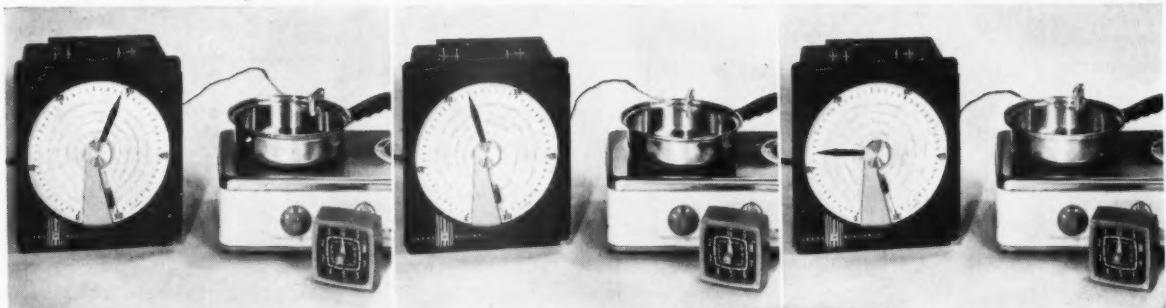
a division of The B.F.Goodrich Company



Circle No. 319 on Reader Service Card.

EVEN DOUBLE THE THICKNESS:

*Fairmont Stainless Clad Aluminum sheet gives you
FASTEST, MOST UNIFORM HEAT TRANSFER*



*Fairmont Stainless Clad Aluminum
.100 THICK*

*Copper Core Stainless
.050 THICK*

*Carbon Core Stainless
.050 THICK*

After five minutes at maximum distance from controlled heat source, pan made of Fairmont Stainless Clad Aluminum, even though double thick, shows 290° F at side wall—in comparison

with 230° F for copper core pan and 120° F for carbon core pan. Utensils furnished by courtesy of Vita Craft Manufacturing Company. The testing devices courtesy, Leeds & Northrup.

LIGHTEST WEIGHT, WITH STRENGTH



*Fairmont Stainless Clad Aluminum
.100 THICK*

*Copper Core Stainless
.050 THICK*

*Carbon Core Stainless
.050 THICK*

Although twice as thick and correspondingly strong, the Stainless Clad Aluminum pan weighs up to $\frac{1}{3}$ less than the copper core or carbon core pans. This means lower shipping

costs. Also, increased sales appeal to Mrs. Homemaker, who will simply love a sturdy pan that's nevertheless easy to lift.

WHAT'S YOUR NEED FOR THIS MAGIC METAL?

2 plus 2 equal 4. And Fairmont Stainless Clad Aluminum—with its unique combination of the strength and corrosion resistance of stainless steel permanently bonded to the light weight, good conductivity of aluminum—adds up to a bonanza in business-building product improvements. In many fields. From pots and pans to appliance and automotive trim, to architectural components. Whatever your line, the above has given you ideas. Let us help you with them. Write for further information. Or phone your local Fairmont office for a Fairmont field engineer.



FAIRMONT ALUMINUM COMPANY

SUBSIDIARY OF CERRO CORPORATION

Sales Offices in Principal Cities

FAIRMONT • WEST VIRGINIA
FAIRMONT 3010 • CABLE ADDRESS: FARMON

Circle No. 312 on Reader Service Card.

BOOST PRODUCTION REDUCE REJECTS

No matter what your porcelain product or process, you *can* realize a significant increase in production rate with five-factor designed burning tools by Ferro. From Ferro you get the benefits of engineering experience in all phases of porcelain enameling—from frits through final product.

This experience enables Ferro to intelligently consider the five factors that are the important difference in recommending standard fixtures, or designing specials. These factors are: weight, size and shape of part; type of furnace; firing temperature; rolled or cast alloy design; minimum-weight sections.

You can start planning today to boost production and reduce rejects by writing for Ferro's new Burning Tool Booklet. It details, individually, a large inventory of cast tooling patterns available.

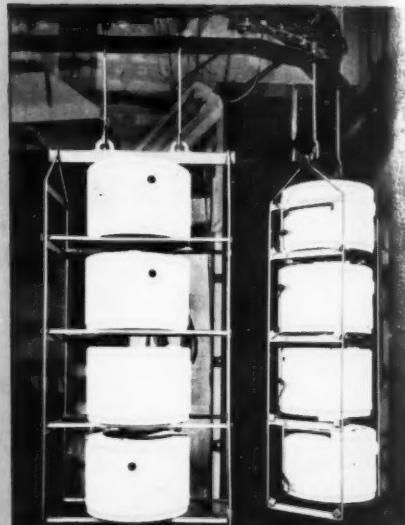
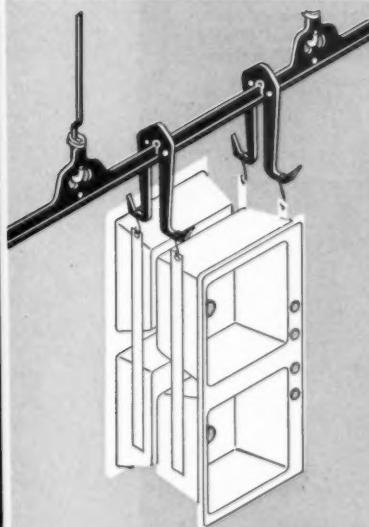
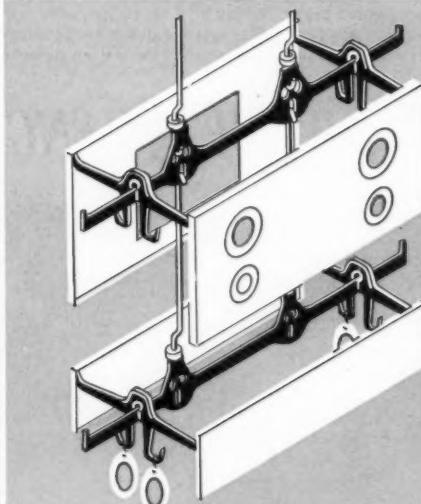


Photo courtesy of Whirlpool Corp., Clyde Division



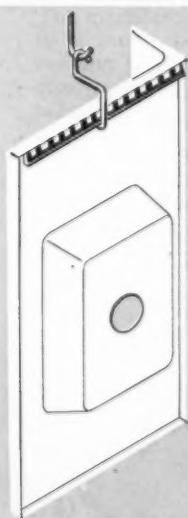
Heavy-duty suspension bar with adjustable coat-hangers, single or double-decking.



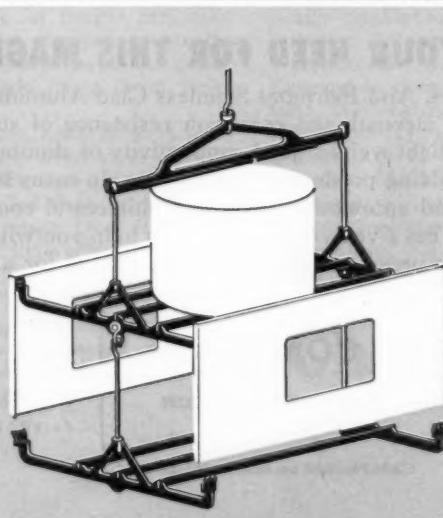
Lightweight suspension bar, 4-pt. coat-hangers, double-decked for variations in range parts.



Box furnace, slot-in-roof tooling, for large flatwear.



Single-hanger hook, for sinks, one-piece fabricated units.



Special hanging fixture, for washer parts, adjustable for single or double-decking.


FERRO
CORPORATION
Engineering Division

4150 East 58th Street, Cleveland 5, Ohio

Circle No. 314 on Reader Service Card.



(Above, left) — District Sales Manager H. Vincent Schaub, National Presto Industries, Inc., with two dehumidifiers introduced by Presto at the Housewares Show. The units are available in two sizes. (Above, center) — Discussing line of electric housewares produced by Iona Mfg. Co., Inc. are Joseph P. Dornich (left), vice president and director of sales, and Gerald F. O'Rourke, promotional sales director. Housewares pictured include portable electric mixers, can openers, blenders and electric drink mixers. (Above, right) — Spacious Sunbeam exhibit displayed the firm's full line of electric housewares and gardening equipment. (Left) — Special pre-show press conference brought four outstanding personalities from the housewares industry together. The panel, moderated by G. C. Kubitz (standing), NHMA president and senior vice president-marketing, Mirro Aluminum Co., included, from left: J. R. Caldwell, board chairman, Rubbermaid, Inc.; Belle Kogan, industrial designer; A. M. Rosenthal, U. S. Dept. of Commerce; and D. J. Knieriem, Associated Merchandising Corp.

MPM PHOTOS

AN MPM STAFF REPORT

THE BIGGEST MID-YEAR TRADE SHOW ever held by the National Housewares Manufacturers Association was staged July 10-14 in Chicago's McCormick Place.

As in January, when the exhibit broke all closed trade show records with a 33,000 opening day attendance and a daily average of 22,000, every square foot of exhibit space in Chicago's new exposition center was filled.

The 902 exhibitors at the summer show exceeded last year's total by 20 percent.

Dolph Zapfel, NHMA secretary, credited consumer buying patterns as well as the move to Chicago for the continuing increase in July show space requests: "Sixty percent of the industry's \$5 billion in annual retail housewares sales occur in the final months of the year," he said.

Zapfel added that despite the size of McCormick Place, many manufacturers could not be accommodated because of insufficient exhibit space.

Exhibiting manufacturers indicated that over 300 new products were presented to buyers at the show. A number of electric housewares were included in this total.

Westinghouse showed a line of housewares including vacuum cleaners, scrubber-polishers, dry and steam irons, portable mixers, toasters and electric can openers.

General Electric showed a line of electric kettles, a lightweight vacuum cleaner, an electric floor washer-dryer, a

Houseware exhibitors jam Chicago's McCormick Place

"toast-r-oven," and a blender. A full line of new electric clocks was also shown.

At a special press conference held the day before the official opening of the show, four persons connected with the housewares industry answered questions connected with their specialties.

Belle Kogan, noted industrial designer, said the flood of new materials being made available by suppliers is opening new areas for designers and manufacturers of appliances.

Aaron M. Rosenthal, chief of the Furniture, Housewares and Sporting Goods Branch, Consumer Durable Goods Div., U.S. Dept. of Commerce, announced that his department is undertaking a large-scale statistical study of the housewares industry to detail sales, imports, exports, etc. He said previously this phase of business was not treated separately because it crossed such a great number of product lines. He added that the results of this fact-gathering program should be of significant help to the housewares industry.

D. J. Knieriem, merchandise representative, Housewares Dept., Associated Merchandising Corp., New York, commented that foreign imports of housewares will eventually result in higher quality of American-made products to compete with the low prices and increasing quality of foreign-made goods.

James R. Caldwell, chairman of the

board, Rubbermaid, Inc., said that the price level of housewares has been stable recently and should remain so in the near future. He added, however, that increased labor costs would no doubt result in higher prices. MPM

R. J. Sargent, vice president and general manager of the Westinghouse Portable Appliance Div., is shown with some of the "extras" being offered purchasers of Westinghouse electric housewares. The "extras" include iron holders, storage drawers and blender attachments for mixers, and combination cover-servings devices for toasters.

PHOTO COURTESY WESTINGHOUSE ELECTRIC CORP.



NOW... A ONE-COAT FINISH FOR EXTERIOR ELECTRICAL CLOSURES

Cut paint/bake time in half with new
SUPER NUBELITE[®] thermosetting acrylic finish

June 27, 1961—The Glidden Company announces a new one-coat finish for electrical enclosures with the weather-resisting properties of traditional two-coat systems.

This newest in the family of Glidden one-coat SUPER NUBELITE finishes has just passed the stringent tests of a leading independent testing institution and is approved for suitable exterior electrical applications.

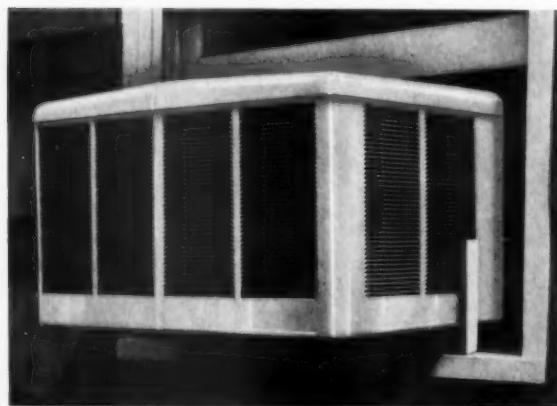
The battery of tests included salt spray, ultra-violet light and water, moist carbon dioxide-sulphur dioxide and moist hydrogen sulphide—all proving the durability of SUPER NUBELITE.

SUPER NUBELITE is applied in a film thickness of 1.5 mils and can attain theoretical coverage of 700 square feet per gallon per mil.

Other one-coat SUPER NUBELITE finishes are already in production on refrigerators, freezers and fluorescent light fixtures. Two-coat SUPER NUBELITE is now being used on clothes washers, dryers and other electrical appliances.

For complete information on one-coat SUPER NUBELITE finishes, call your Glidden representative or write direct.

Air conditioners and other exterior electrical enclosures can be finished with SUPER NUBELITE for superior weather protection at one-coat economy.



Key to approval by leading independent testing institution was salt spray test. Above panel, coated with one-coat SUPER NUBELITE shows creepage of less than $\frac{1}{16}$ inch along scribes after 2208 hours exposure.



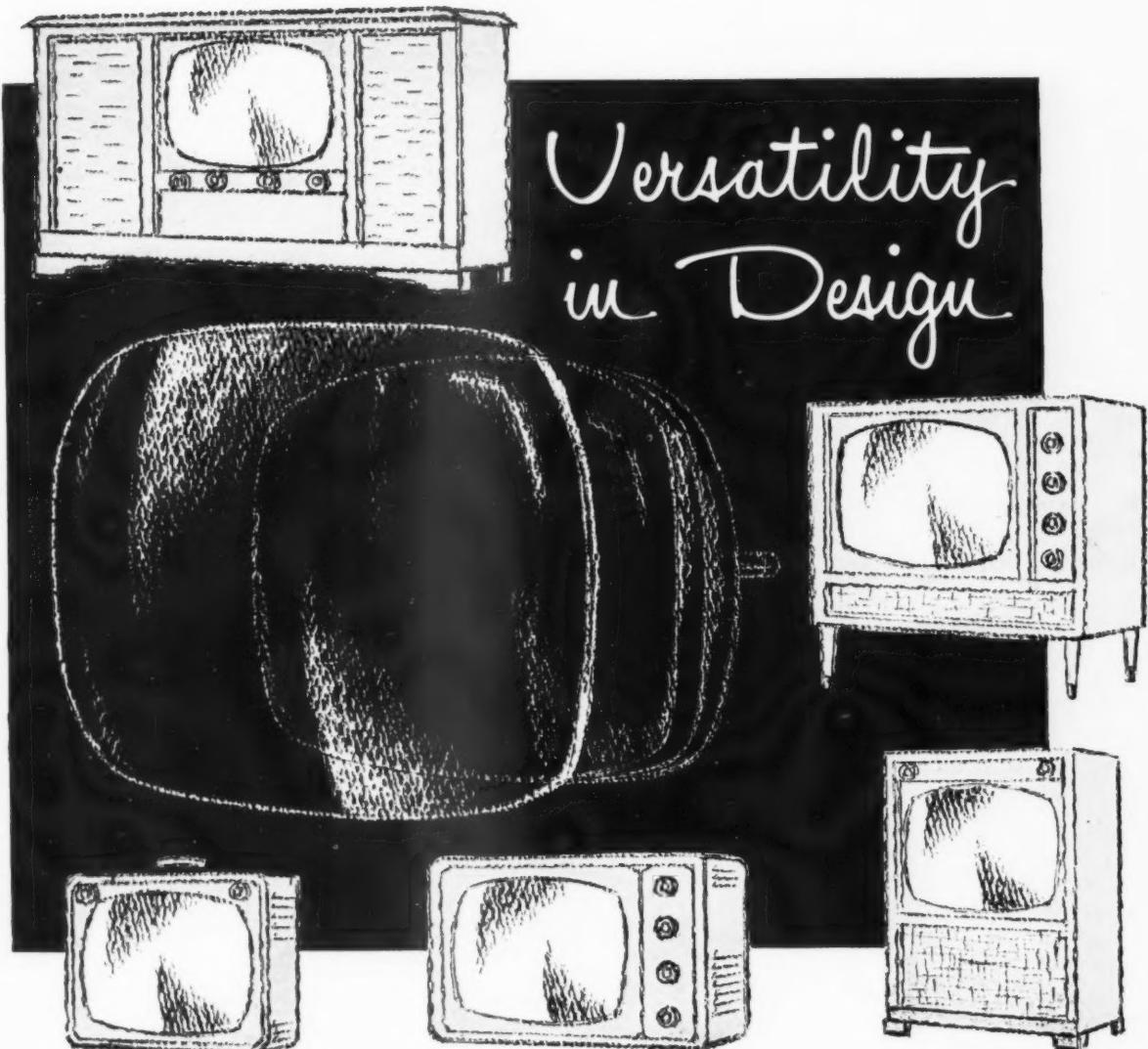
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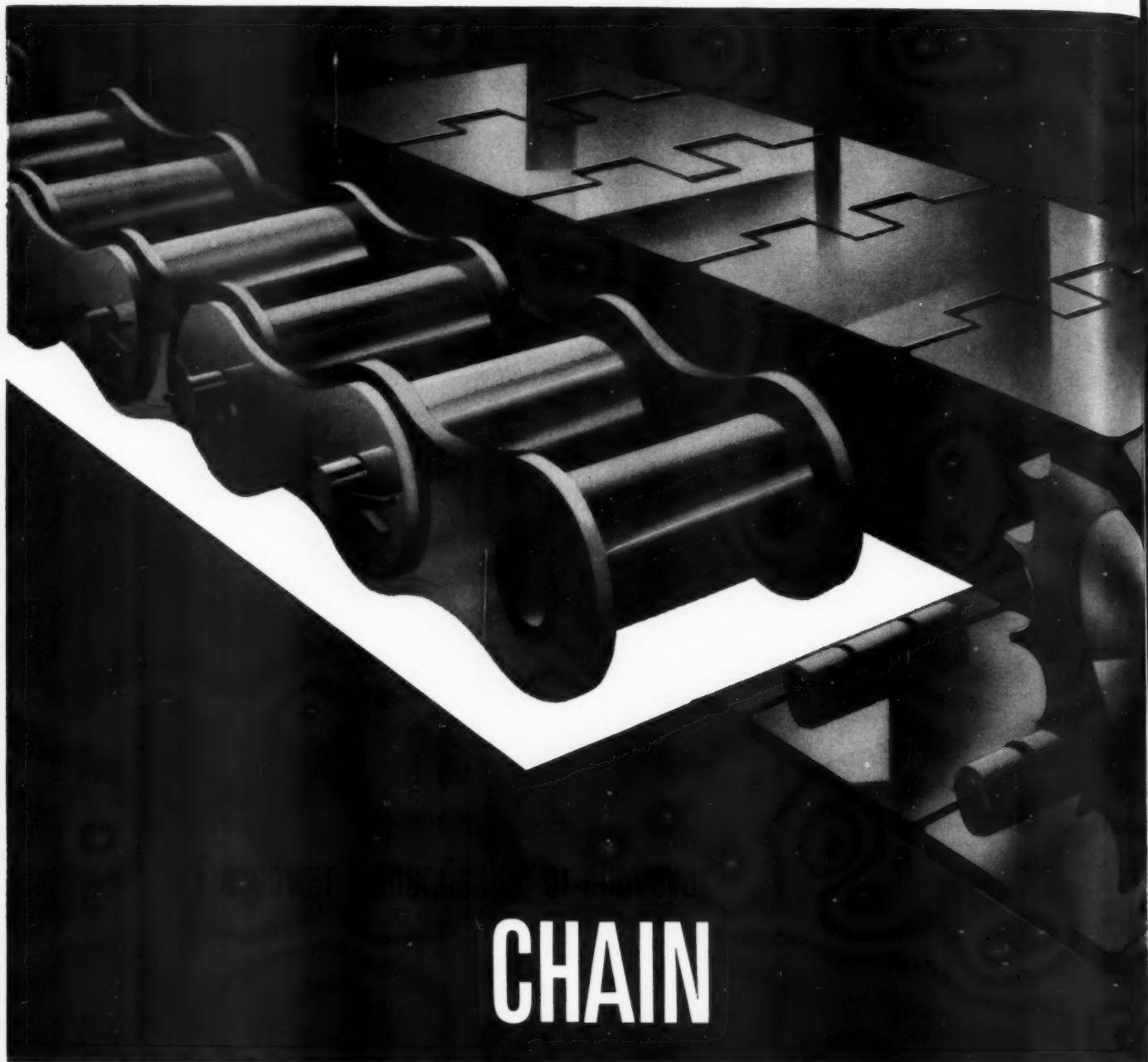
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No matter what your end-product may be, if your production processing requires metal-cleaning, rustproofing or any-type finishing from heavy-duty enamels to sales-stimulating lacquers, you can 'lean' on Mahon's Industrial Equipment Division. Here's an organization with the broadest finishing experience . . . and the one-source capability for planning, engineering, fabricating, erecting and servicing that means quality and efficiency at lowest true cost. Mahon designs industrial equipment but *engineers results from start to finish*. If you are interested in new or improved finishing facilities, Mahon would like to work with you in doing the job right.

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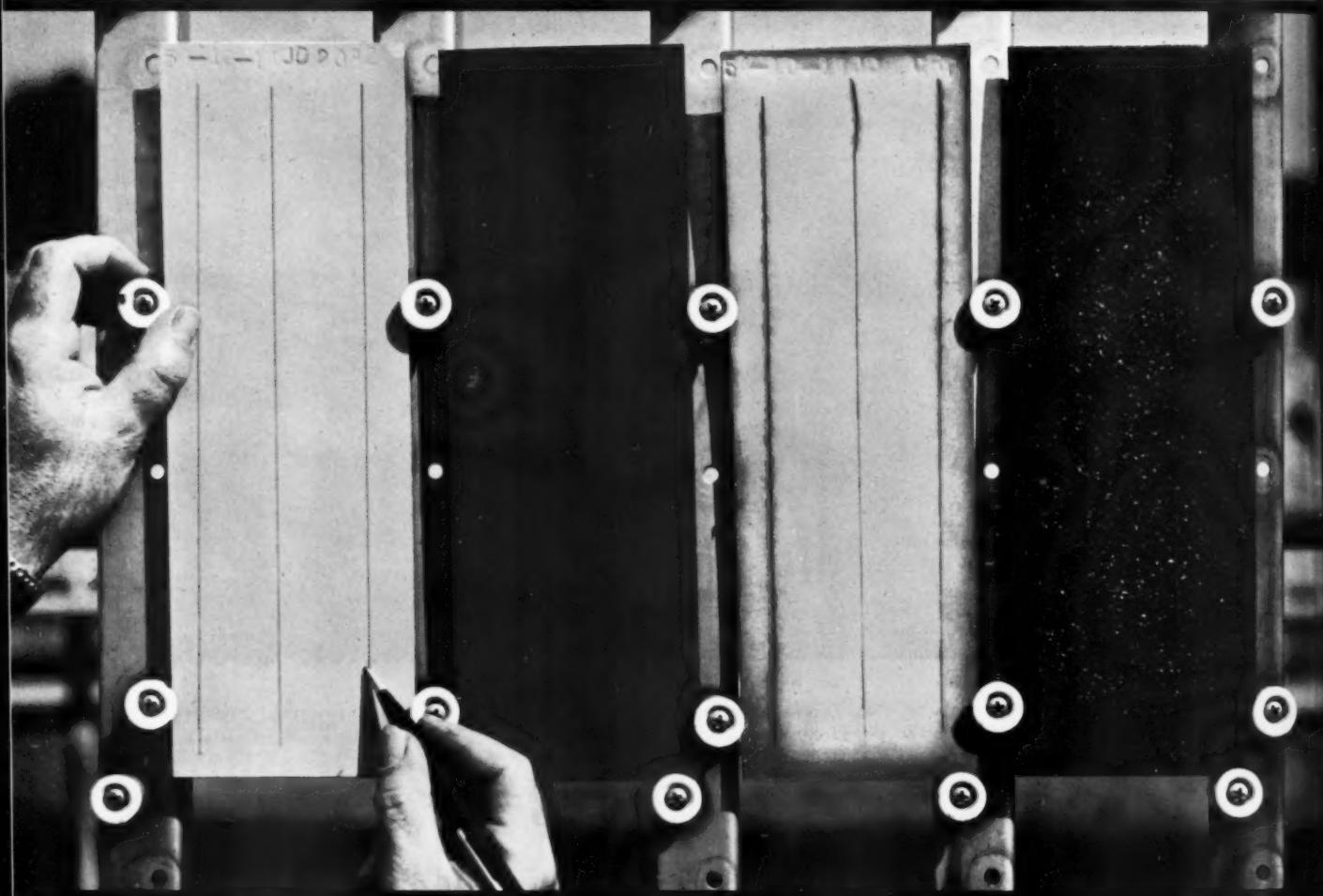
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ZINCGRIP A, PAINTGRIP

Suggested Applications

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- Home Freezer Cabinets
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- Vending Machines
- Water Heater Casings

Now—add the extra protection of a full weight zinc coating to your appliance cabinets with assurance of a spangle-free surface that can be painted immediately.

The sheet steel that makes this possible is new Armco ZINCGRIP® A, PAINTGRIP®. Its zinc coating is spangle-free and especially prepared for immediate painting. Three years' testing shows that paint adherence and life on ZINCGRIP A, PAINTGRIP is superior to that on phosphate treated cold-rolled steel or any other galvanized sheet steel prepared for painting. It's more weldable than other hot-dipped zinc-coated steels, yet has equivalent corrosion resistance and forming characteristics.

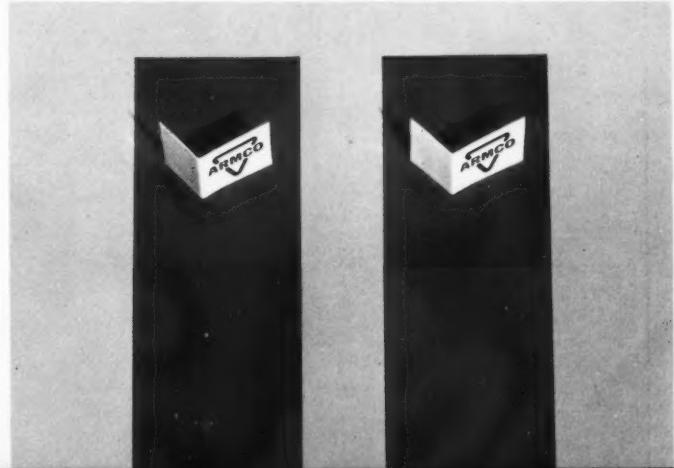
The new grade is now available with full weight coating (1.25 ounces per sq. ft.), or a light commercial coating in 16 through 24 gage coils or cut lengths up to 48 inches wide depending on gage. For complete information, just write **Armco Division, Armco Steel Corporation, 1891 Curtis Street, Middletown, Ohio.**

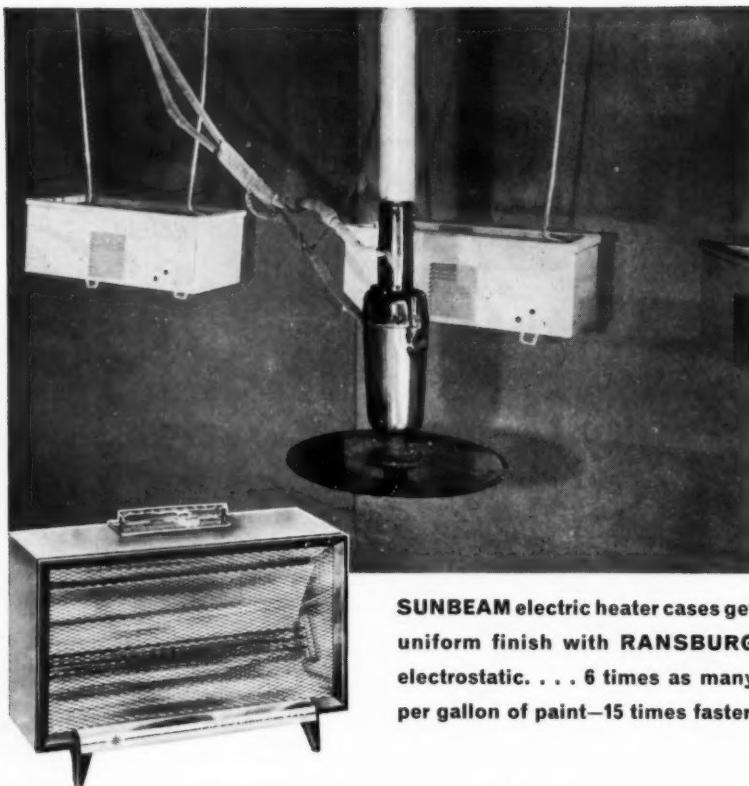


Armco Division

Top: The first two samples are Armco ZINCGRIP A, PAINTGRIP and the last two are cold-rolled steel that was treated for painting. All have been exposed for three years in Armco's corrosion testing yard. Note complete absence of rust on the first two, while even sample number three failed to fend off corrosion.

Bottom: The zinc coating on Armco ZINCGRIP A, PAINTGRIP is so carefully controlled that no spangles are allowed to form, giving the material a smooth surface for painting. Sample at left is cold-rolled steel whose surface was treated for painting, and at right is Armco ZINCGRIP A, PAINTGRIP. Top half of each sample is painted.





SUNBEAM electric heater cases get uniform finish with **RANSBURG** electrostatic. . . . 6 times as many per gallon of paint—15 times faster.

"Paint Mileage Leaps 500%.... Production Upped 15 Times" Reports ENAMELED STEEL & SIGN CO.

Curt Simmons, President, ENAMELED STEEL & SIGN COMPANY of Chicago, describes results with RANSBURG Automatic No. 2 Process Electro-Spray: "We first painted cases for the new SUNBEAM portable electric heaters with air hand spray at the rate of 200 pieces per day using 6 gallons of paint. Now, with RANSBURG electrostatic we've increased production 1400% to 3000 pieces daily with only 15 gallons of paint." An increase of 500% in paint mileage! *What would savings like this mean in your finishing department?*

QUALITY IMPROVED WITH RANSBURG ELECTRO-SPRAY

Sags and runs, a problem with the air hand spray, have been eliminated with the automatic electrostatic equipment. Mr. Simmons adds: "Now we achieve a uniformity over the configurated area which wasn't always possible before. We know the 50,000th piece will turn out the same as the first."

ENAMELED STEEL—sold on the efficiency and versatility of RANSBURG Electro-Spray—uses 14 automatic No. 2 Process units to meet the heavy demands of their diversified, high volume production.

NO REASON WHY YOU CAN'T DO IT TOO

Manufacturers—large and small—are reporting similar savings in paint and labor with increased production. If your volume doesn't justify automatic electrostatic equipment, perhaps the RANSBURG electrostatic hand gun will help cut costs in your finishing operation. Write for our new brochure showing actual in-plant production photos, savings figures and detailed information on RANSBURG No. 2 Process Electro-Spray.

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MPM

industry meetings

NATIONAL

GAS ASSOCIATION

The Pacific Coast Gas Association's 68th Annual Convention, Hotel del Coronado, Coronado, Calif., September 13-15, 1961.

PORCELAIN ENAMEL

The American Ceramic Society, Inc.'s Divisional Fall Meeting on Enamel, French Lick-Sheraton Hotel, French Lick, Ind., September 20-23, 1961.

AHLMA PARTS & SERVICE

The American Home Laundry Manufacturers' Association's 9th Parts and Service Conference, Sheraton-Chicago Hotel, Chicago, Ill., September 21, 1961.

WELDING

The American Welding Society's Fall Meeting, Adolphus Hotel, Dallas, Texas, September 25-28, 1961.

PORCELAIN ENAMEL

The 30th Annual Meeting of the Porcelain Enamel Institute, The Greenbrier, White Sulphur Springs, W. Va., October 5-7, 1961.

INDUSTRIAL DESIGNERS

The 17th Annual Meeting of the American Society of Industrial Designers, Ambassador Hotel, Los Angeles, Calif., October 5, 1961, and St. Catherine Hotel, Santa Catalina Island, October 6-8, 1961.

PACKAGING FORUM

The Packaging Institute's 23rd Annual National Packaging Forum, Biltmore Hotel, New York City, N. Y., October 18-20, 1961.

METAL SHOW

The 1961 Detroit Metal Show and ASM Materials Comparison Center, sponsored by American Society for Metals, Cobo Hall, Detroit, Mich., October 23-27, 1961, and 43rd National Metal Congress, presented by American Society for Metals and eight participating organizations, Cobo Hall, Detroit, October 23-27, 1961.

HOME LAUNDRY CONFERENCE

The American Home Laundry Manufacturers' Association's 15th National Home Laundry Conference, Pick-Congress Hotel, Chicago, Ill., October 25-27, 1961.

AUTOMATIC MERCHANDISING

National Automatic Merchandising Association's 1961 Convention-Exhibit, McCormick Place and Conrad Hilton Hotel, Chicago, Ill., October 28-31, 1961, and the First International Symposium of Automatic Merchandising, October 31-November 1, McCormick Place.

PACKAGING EXPOSITION

Packaging Association of Canada's 10th Canadian National Packaging Exposition, Automotive Building, Exhibition Park, Toronto, Ontario, Canada, October 31-November 2, 1961.

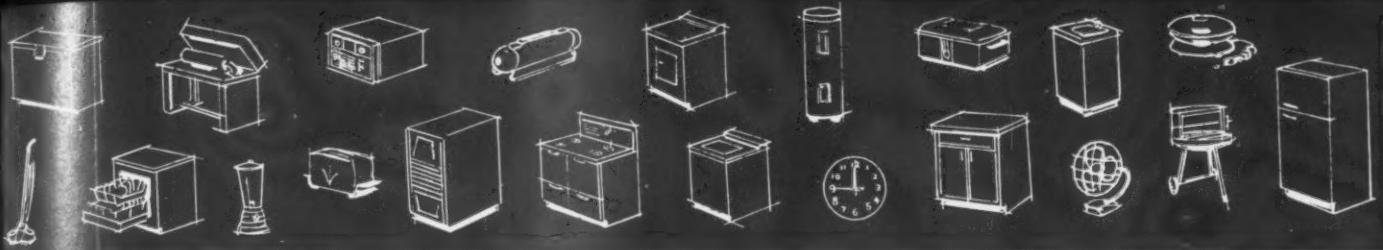
SECTIONAL

ENAMELERS

Eastern Enameler's Club Annual Outing, Hunsicker's Grove, Alburtis, Pa., August 5, 1961.

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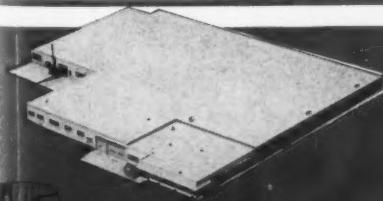
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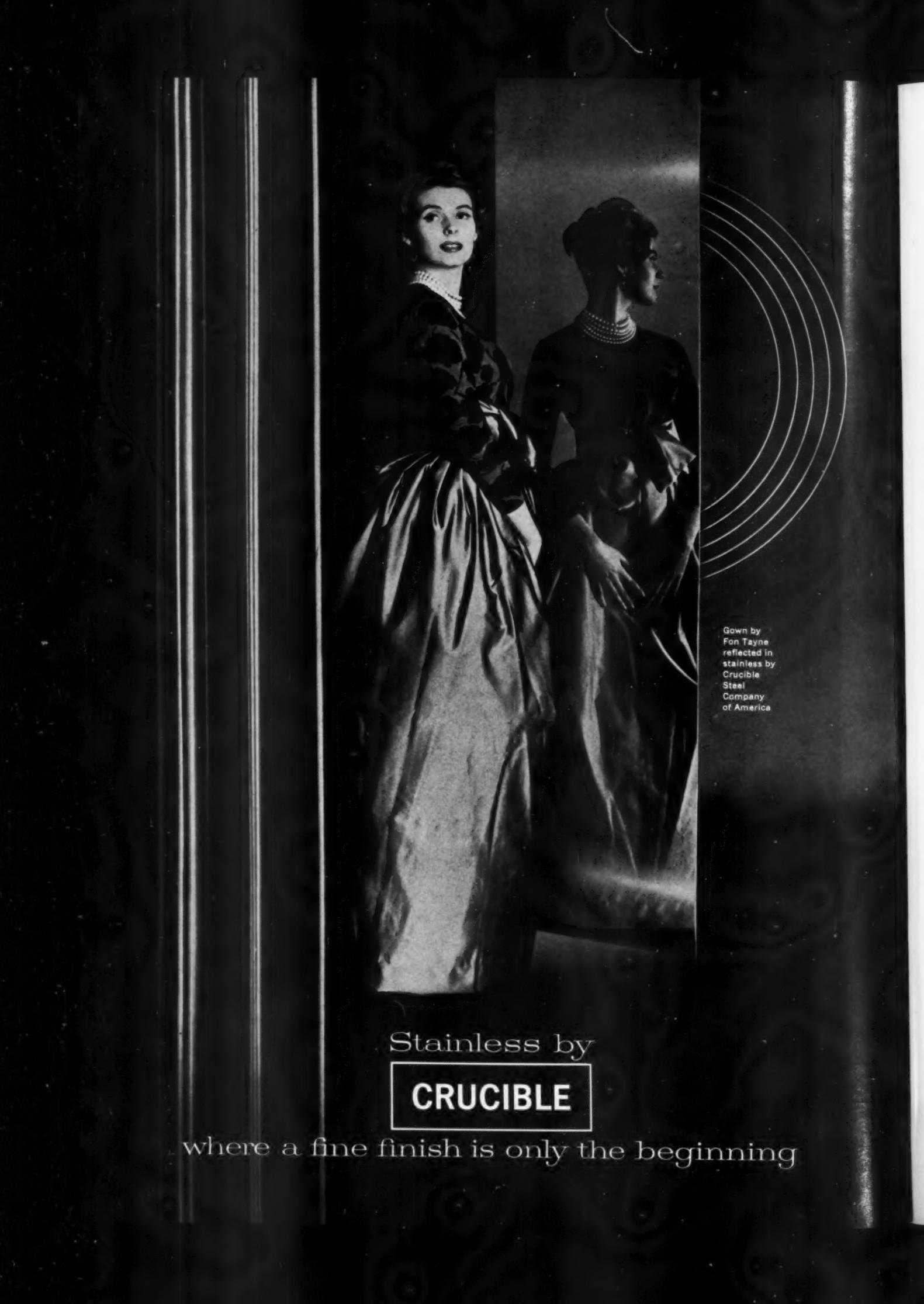


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CRUCIBLE

where a fine finish is only the beginning

MPM

editor's mail

Air conditioner corrosion

Gentlemen: I read with much interest your editorial in the July issue of METAL PRODUCTS MANUFACTURING. It contains no exaggerations whatsoever and should do a bit toward bringing into focus the problem of corrosion in coastal areas. Just last week we replaced one of the old ——— units (in No. 17) with a new ———. This was done despite the fact that the five year warranty on the ——— would not have expired until November, and they live up to this guarantee. However, the cost of a new shell or additional cost of a new fan motor within a year or less caused us to purchase a new ——— unit. It will be three or four years before we know how well the ——— stands the salt air.

Benjamin G. Kilpatrick
The Beachcomber Villas
Pompano Beach, Fla.

Beachcomber Villas represents the location of the air conditioning equipment covered in FINISH LINE reports for the past two years.

The Editors

Credit where credit is due

Excellent reader attention has been evidenced in connection with the article in July MPM titled "How Kaiser Reduced Bathtub Scrap from 7 to 1 Percent."

In this connection, MPM editors extend credit to V. G. Gerschutz of Kerns United Corp., Chicago for the original lead and important details, and to D. O. Wagster of Kaiser Metal Products Co., Bristol, Pa. for cooperation in connection with this feature.

Gentlemen: Thank you for sending me the copy of page 55 of your current issue of METAL PRODUCTS MANUFACTURING, stating that I have "been named treasurer of The General Industries Co., Elyria, Ohio," and that I "joined the company in 1927 as cashier."

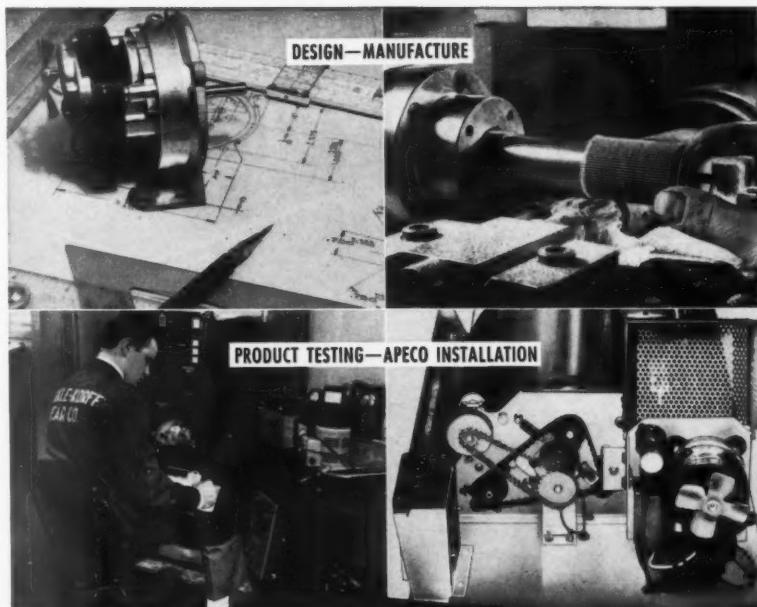
Apparently there has been some misunderstanding as I started my work with this company in May of this year. My predecessor, C. F. Russert, who recently resigned from this company, began his work here in 1927 as cashier.

I thought you might be interested in this correction.

H. K. Johnson, Treasurer
The General Industries Co.
Elyria, Ohio

A check of the MPM editorial evidence file shows the news release to be clear in its statement that it was Mr. Russert who joined General Industries in 1927 as cashier.

The Editors



HOW MERKLE-KORFF
"PERFORMANCE
BALANCE"
PAYS OFF
IN FHP
GEARMOTOR DEPENDABILITY

Performance Balance is the perfect mating of Merkle-Korff motor and gearing to your specific application. It prevents money waste and equipment damage through overpowering, and eliminates operating failures due to occasional low voltages and the many hidden hazards of underpowering. Either, or both, the result of "underknowledge" of the drive system by a gearmotor manufacturer.

Merkle-Korff's total understanding based upon 50 years of experience in supplying the right power unit for any given job is available to you. We will, and do, develop and manufacture gearmotors designed to your individual requirements, not only to perform satisfactorily, but to do so at lowest cost. Merkle-Korff service is unique in this respect.

Performance Balance, therefore, is not just a play on words. It is your guarantee of on-the-job performance and dependability. Thousands of cases exist proving the worth of Performance Balancing.

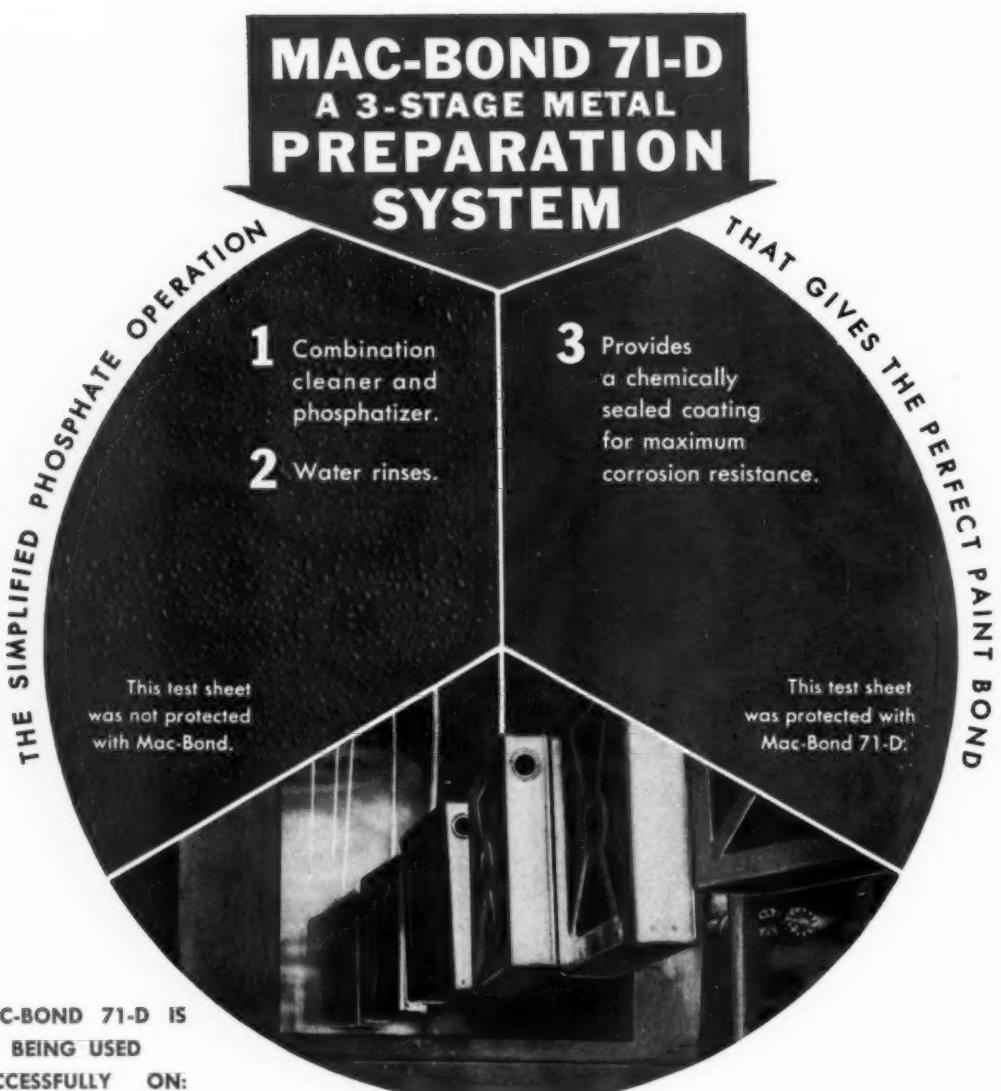
Literature is available. Better still, send us your drawings or product sample so our Applications Engineers can give you a complete evaluation of motor and entire drive system! There is no obligation.



MERKLE-KORFF GEAR CO.

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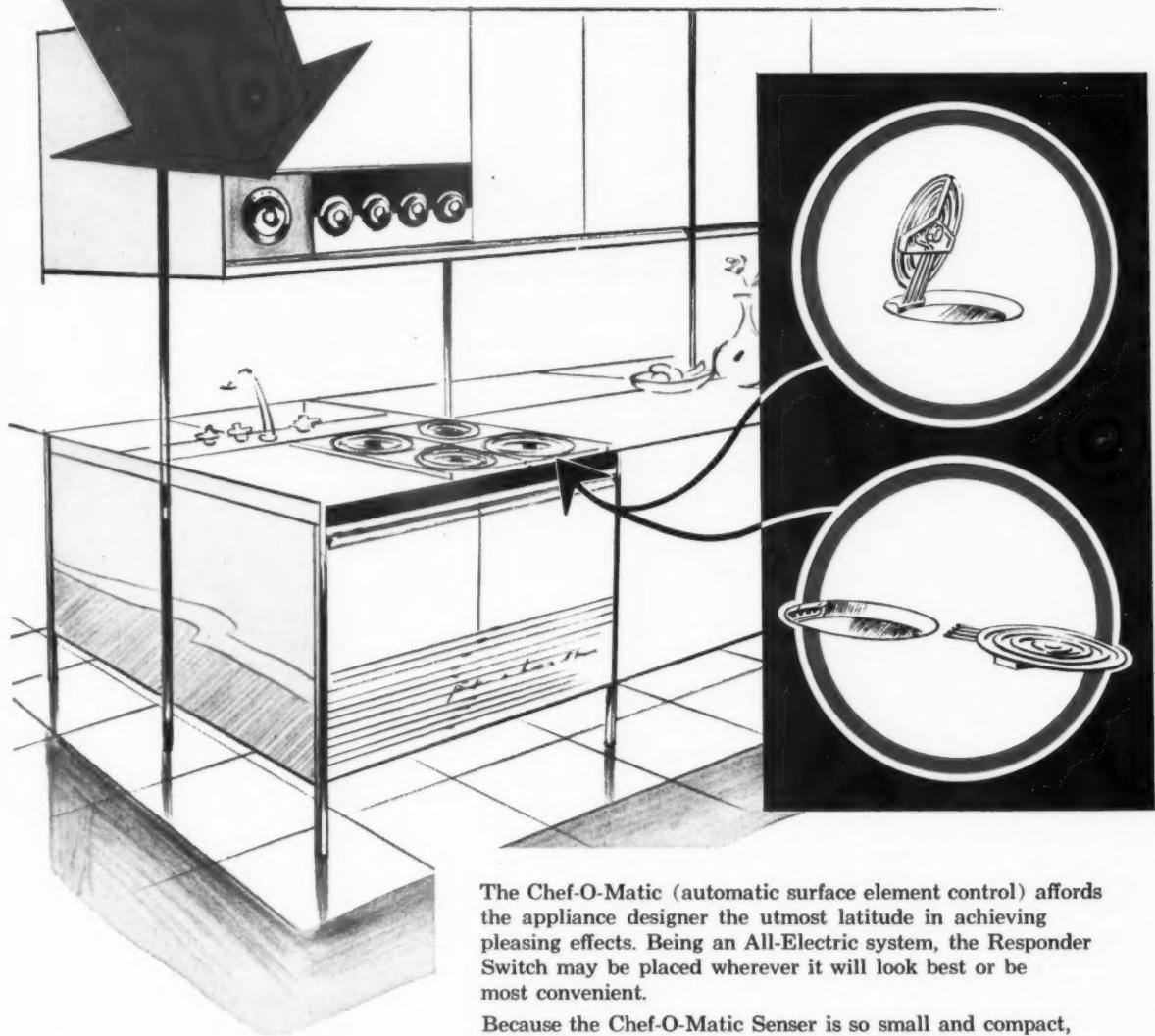
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New CHEF-O-MATIC SMART APPLIANCE DESIGN

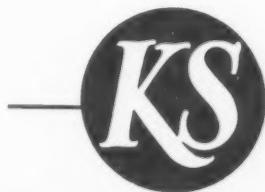


*Don't fail to investigate Chef-O-Matic
for use on your new models.
Write for bulletin.*

The Chef-O-Matic (automatic surface element control) affords the appliance designer the utmost latitude in achieving pleasing effects. Being an All-Electric system, the Responder Switch may be placed wherever it will look best or be most convenient.

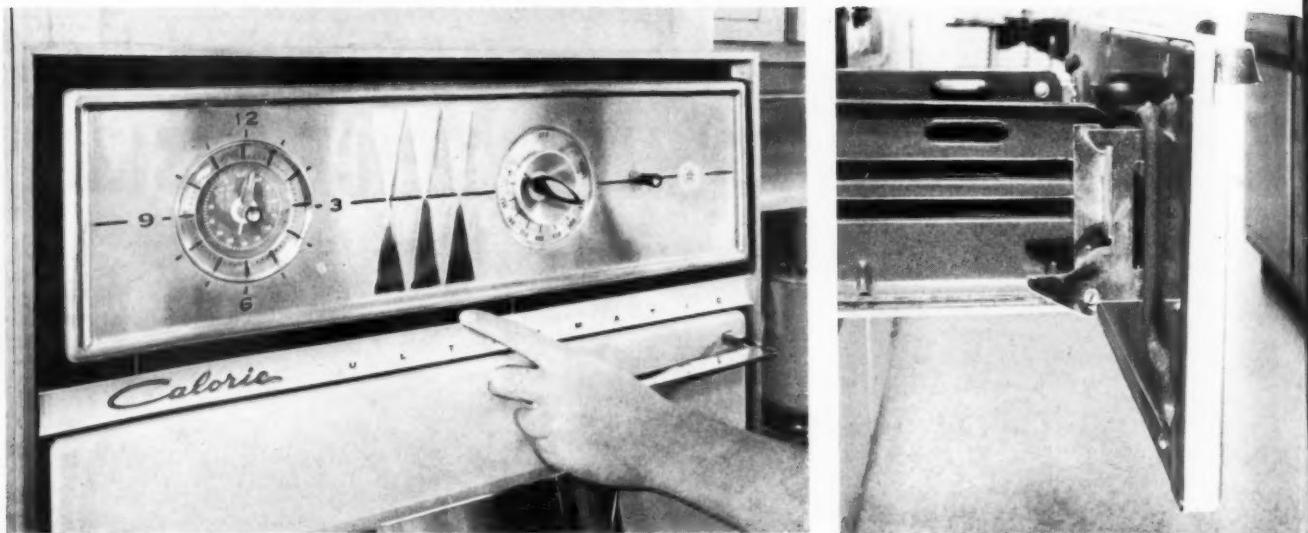
Because the Chef-O-Matic Senser is so small and compact, custom-built cook tops can be thinner and the space saved can be used for other features.

This senser can also be an integral component of the latest type "Pull-Out" surface element — easiest to clean — uses a shallow unpunched drip pan (no center hole) — less space — better heat reflection.



KING-SEELEY DIVISION
OF
KING-SEELEY THERMOS CO.
ANN ARBOR, MICHIGAN

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Caloric reveals "Dualaire" air flow system

AN MPM DESIGN FEATURE

new air flow principle eliminates need for sealed kitchen cabinets around Ultramatic built-in gas range

CALORIC APPLIANCE CORP.'S new Ultramatic built-in gas ranges, introduced earlier this year, are equipped with "Dualaire" air flow system, a new principle of gas range ventilation.

The system reverses the internal air pressures of the oven-broiler, according to George Myler, Caloric's director of product planning. Previously, internal air pressures were positive, requiring critical "sealing" of doors to prevent heat leakage. The Dualaire, instead, creates a negative pressure inside the range compartment and all combustion air is drawn in around the perimeter of the broiler door.

Caloric has applied for domestic and foreign patents for the system, which is said to:

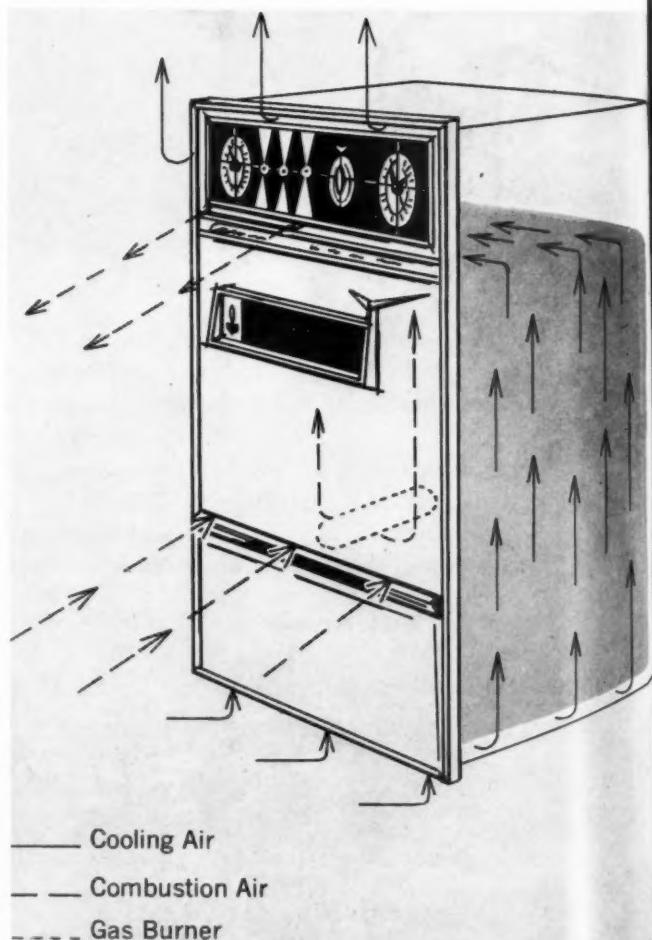
- Eliminate the need for expensive sealed kitchen cabinets around the unit. The Dualaire system will, however, operate equally well in sealed cabinet installations.
 - Virtually eliminate pilot "outage" caused by air drafts inside the kitchen cabinet housing the range. This is considered insurance against the problem of air leaking into the cabinet because of faulty cabinet construction, settling of the building, etc.
 - Significantly reduce the range's exterior temperature at the broiler handle, usually considered the warmest area of a gas range's front panel.
- Myler said the Dualaire system has two basic new design ideas:
- Air for cooling the range is separated

(Above, left) — Exhausted combustion air is vented through an opening below the control panel. It is separated at all times from the cooling air.

(Above, right) — Broiler door has U-shaped spacer to keep it away from the front frame, allowing combustion air to be drawn in around the perimeter of broiler door.

(Far right) — Features of the new Ultramatic built-in oven-broiler include an 18-in. oven that fits a standard 24-in.-wide cabinet opening, oven door that lifts off for easy cleaning, removable broiler door, and six-position broiler tray for exact cooking control. Automatic controls assure the right oven temperature, as it is measured automatically inside the meat being cooked.

(Right) — Drawing illustrates how combustion air is drawn in around broiler door and exhausted through opening below control panel. Cooling air enters at bottom and is circulated around sides, top and back of oven. Openings around edge of control panel allow escape of cooling air.

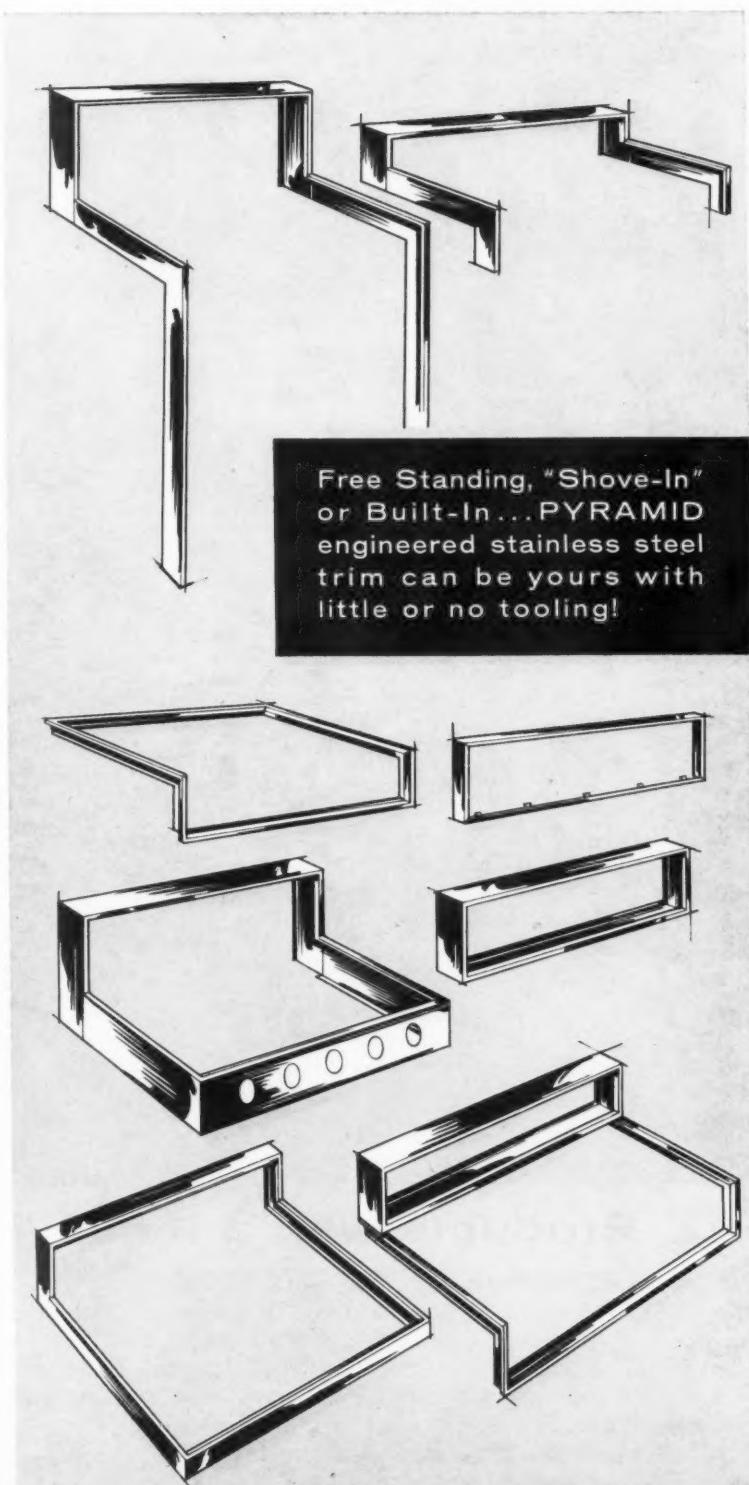
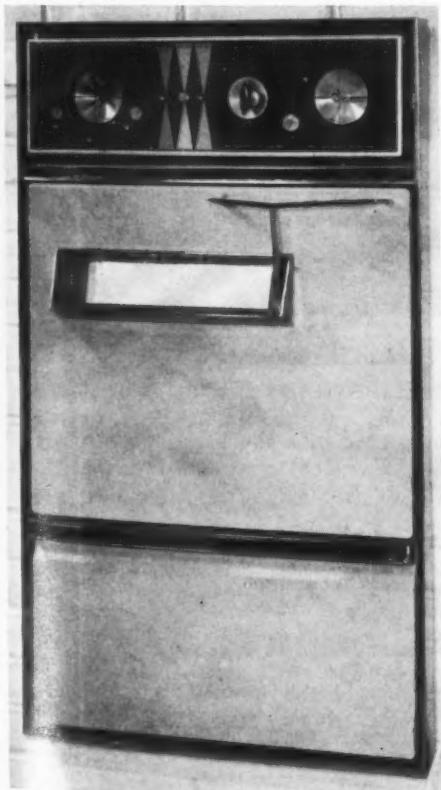


at all times from the air for combustion. • A suction-like action takes all combustion air in around the perimeter of the broiler door, making a tight seal unnecessary to prevent heat leakage.

The Caloric oven compartment is of welded construction, porcelain enameled as one unit so that air in the oven and broiler interior is completely separated from the air in the rest of the range. Cooling air is taken in through an opening notched in the bottom of the range's bezel frame and through a series of openings in the front frame. The cooling air moves up to the outside of the oven unit, bathing the sides, back, and top before passing out through an exhaust opening around the edges of the control panel. Any variations in the direction or velocity of the circulating cooling air cannot affect the pilot or burner flame.

All combustion air for the Caloric oven-broiler unit is drawn in around the broiler door perimeter which is spaced away from the front frame. Exhausted combustion air is vented through an opening below the control panel.

No heat escapes around the broiler door because the entering air for combustion acts as a curtain, effectively sealing the openings against leakage of heat, Myler explains. In fact, the action of the incoming air serves to cool the lower part of the oven door and the upper edge of the broiler door. MPM

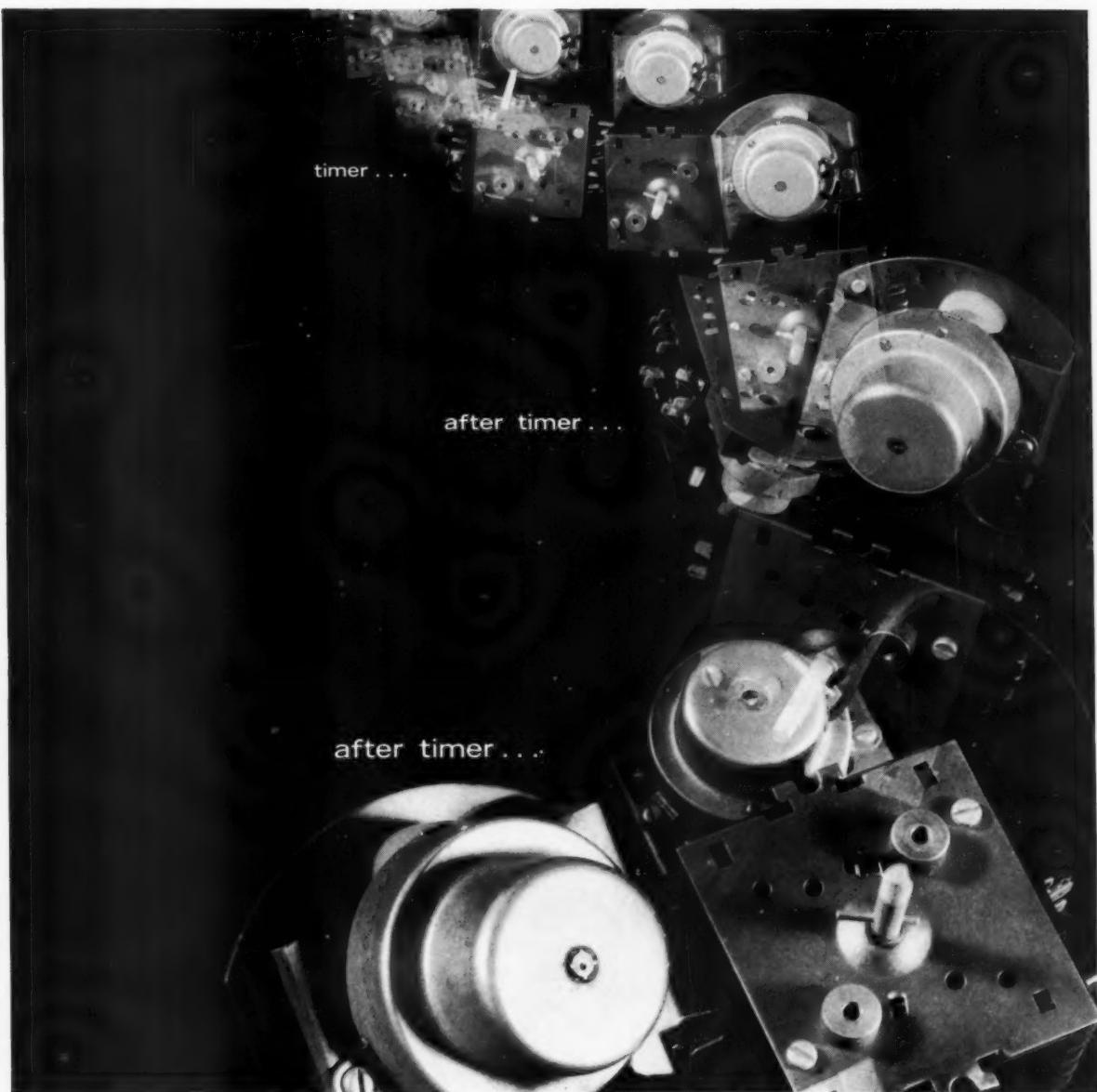


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AN EXCLUSIVE MPM FEATURE

PRESSURE-SENSITIVE TAPE is assisting Art Metal, Inc. in upgrading its top line of metal desks by enabling a smear-free, more efficient technique for sound damping the metal.

In addition, the new method is credited with eliminating costly maintenance problems, preventing desk drawers from sticking, and with making each desk "a more solid piece of furniture."

Up to 500 desks are produced daily with this tape at the firm's desk manufacturing plant in Avenel, N. J., according to Russell Anderson, manager of the plant's industrial engineering department. He said the technique has replaced a spraying method for adhering damping material to the desks, and is being used presently on all of the firm's "1500" premium desk line.

The old spraying technique frequently led to spray smear on the metal, occasional implant rejects due to drawers being stuck by the smear, and maintenance costs of approximately \$150 per month, declared Anderson. Cleanup time for scraping off the smear took about five minutes per drawer.

Cleanup eliminated

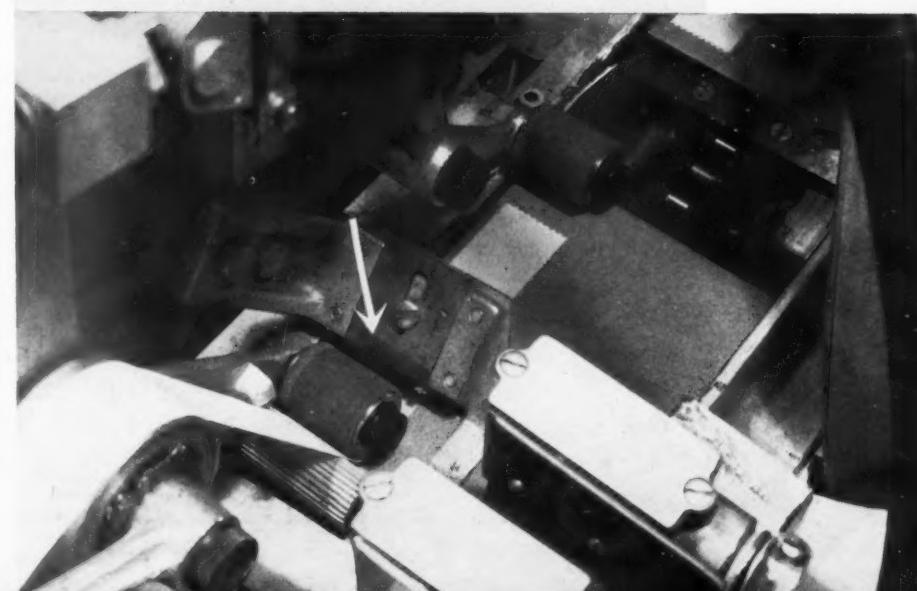
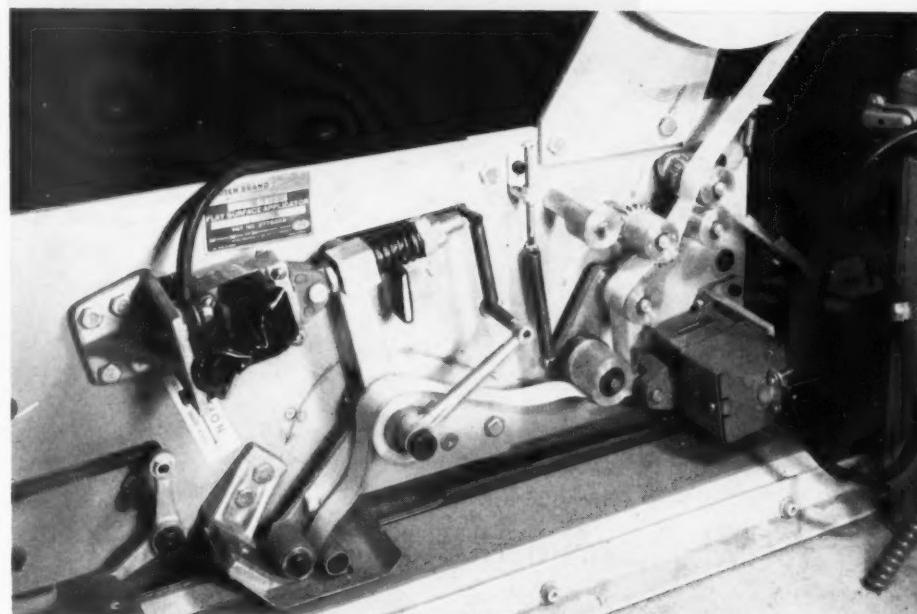
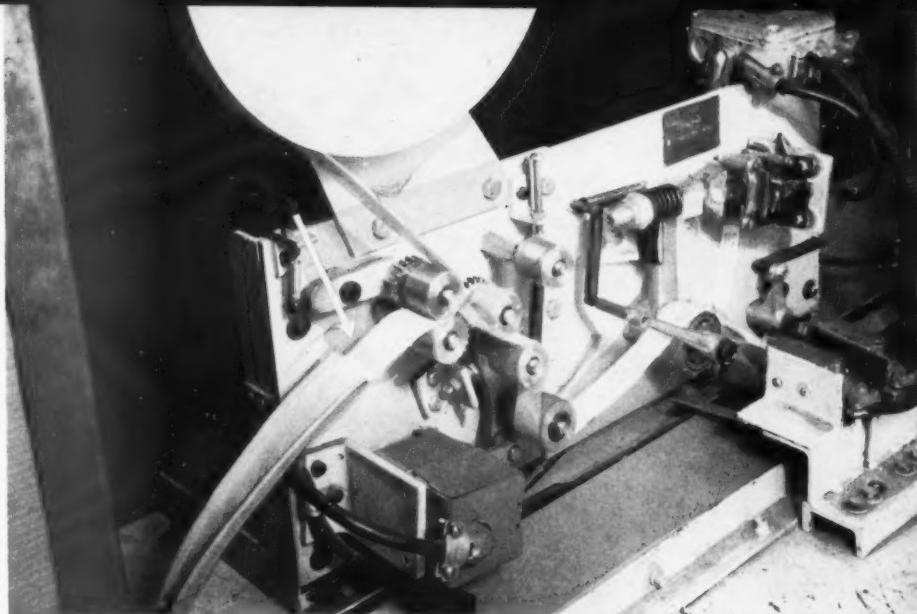
Now, since there's no need for scraping, there are no cleanup problems and the entire damping operation can be accomplished smoothly and rapidly without the need for spray guns and air-pressure pumps, required for the spraying, or for maintaining all of this equipment, Anderson pointed out.

The principal part of the taping is done automatically by two taping machines which enable complete damping of the cabinets of each desk in only three minutes. Two solenoid taping heads are used to dispense the tape, and are adjusted to work in perfect timing with the one operator needed to assist the entire damping operation.

Each machine has a special 288-yd-

PHOTOS COURTESY MINNESOTA MINING & MANUFACTURING CO.

(Top) — The tape liner (arrow) is pictured being automatically unwound from the tape and directed into a duct which leads it to waste baskets below the tape roll. As soon as the liner is removed, the tape is exposed for instant adherence to the wallboard. (Center) — The 2½-in.-wide double-coated tape is shown being applied to the left margin of the wallboard as the wallboard first passes under the left taping head. Each piece of tape is 20 in. long and is applied by silicone rubber rollers which prevent it from sticking on the applicators. (Right) — The right margin of the wallboard is taped by the right taping head. The blade is in front of the roller (arrow) and cuts the tape a half an inch from the end.





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long tape roll which permits continuous taping for six hours. Each roll can tape up to 50 desks per day. It takes only about one minute to change the rolls, with the system so timed that while one roll is being changed the other can remain in use. It is never necessary to shut down the taping for changeover.

Two types of tape

Two different types of tape are used — 2½-in.-wide double-coated (sticky-on-both-sides) tape for adhering special vibration-damping wallboard sheets to the metal pedestals of each cabinet interior, and 4-in.-wide aluminum foil tape with special vibration damping properties for applying directly to the metal pull (typewriter) shelf of each desk.

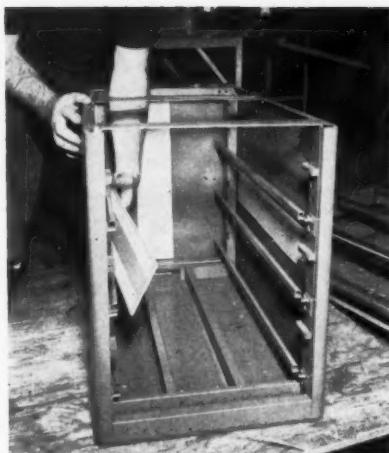
The machines, only 12 in. apart on the same worktable and divided by a special automatic and intermittently-driven roller chain conveyor, are used to apply the double-coated tape to the 21-in.-long wallboard sheets. Only six 20-in.-long tape strips are needed on each cabinet. With one side of the tape adhered to the wallboard, the other side, still exposed, is used for manually adhering the wallboard to the metal pedestals of the cabinets.

Applying the tape

Here's how the step-by-step mechanical taping is accomplished:

1. The 8-in.-wide sheets of wallboard are fed automatically and individually into the taping heads from the wallboard stack directly behind the machines. One head is on the right side of the taping table and the other on the left.
2. As the tape is dispensed, the paper liner protecting the tape is removed automatically by small cylinders called pre-stripers, and directed into waste baskets under the machines via a metal duct leading from each tape roll.

(Left) — Overall view of the new taping station at Art Metal, Inc., where up to 500 metal desks are sound dampened daily. The two taping heads, one on the right and the other on the left of the automatic conveyor, are activated when the foot lever under the machine table is pushed. Each machine is capable of up to 75 tape applications per minute. (Right) — The operator adheres three sheets to each cabinet. One is applied to each side and the other to the back. The tape, one side adhered to the sheet, the other to metal, is sensitive to the touch.



and the back sheet vertically. Slight finger pressure on the back of each sheet is sufficient for instant adhesion.

Variable speeds

The machines can be regulated as to speeds and can apply up to 75 tape strips per minute. Measuring 21¼ in. long, 6¼ in. wide and 11¾ in. high, both taping heads are mounted on a movable table approximately 4 ft high for operating convenience.

The aluminum foil tape, adhered to the bottom of each pull shelf, is applied by a small hand roller — after coming out of a "definite-length" dispenser.

The entire foil application takes only about one minute per shelf. Two strips 8 in. long are applied under each shelf, about 4 in. apart. With annealed aluminum foil backing, this tape has a specially compounded long-aging adhesive with a high mechanical hysteresis over a wide temperature range. Vibrations are reduced by the tape's conversion of energy which results from mechanical shearing action of its dissipative adhesive which occurs when the adhesive becomes distorted by flexing of the shelf.

Another damping operation involves the use of aluminum foil tape. Two strips of the tape, 4 in. wide, are applied under each pull shelf as shown. The roller assures maximum adherence and smooths the tape.

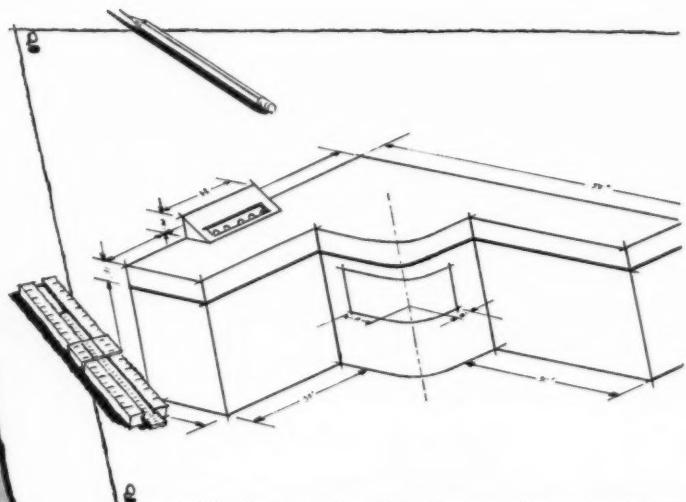


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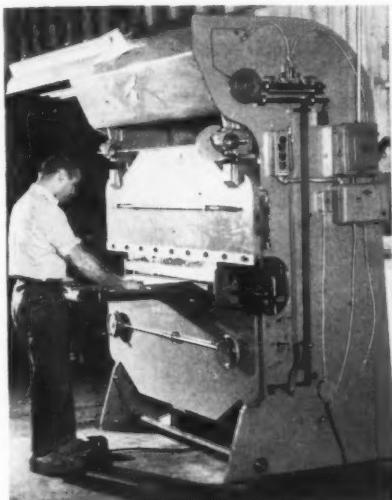
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Small press brakes can pay big dividends

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and much miscellaneous work
on 25-ton
hydraulic press brakes**



Press brake operator Jim Plocker corrugates aluminum using special corrugating dies made for Di-Aero 25-ton hydraulic press brake.

CORRUGATION OF ALUMINUM radio boxes is done on a Di-Aero 25-ton hydraulic press brake at Flour City Ornamental Iron Co., Minneapolis. The press brake was bought two years ago with the corrugation work in mind. Flour City made five special corrugating dies for use with the new brake.

Though production runs sometimes go as high as 4000 to 5000 pieces, the machine is also used frequently for short runs of 25, 50 or 100 pieces.

More recently Flour City added a second press brake of the same type and size and equipped it with the special corrugating dies for the same kind of work.

Though the 25-ton press brakes were purchased for corrugation work, and are regularly used for that purpose, they are used about 50 percent of the time for other work. A considerable amount of 90° bending work is done, mostly with aluminum.

Phil Cook, foreman of the brakes and shears department, says: "This machine is about the handiest thing in the shop. It takes only one man to operate it. Between production runs, we can use it on the little stuff. Sometimes you need only

one piece at a time for replacement or experimental purposes. Our 25-ton press brakes are ideal for that. On the other hand, we often push work material through them at rates of 200 to 300 pieces an hour."

Flour City does most of its work on contract. A large part of its steady repeat business is in radio boxes (which the company has been making for nearly a decade), steel and aluminum windows, electric stairway parts and aluminum boats. The company is also well known for its work in the production of curtain-wall panels.

Before buying a 25-ton hydraulic press brake, the company had only its much larger press brakes in the 500, 700, and 1000-ton categories. These machines are normally operated with two men, which runs up the cost of working "small stuff."

Cook adds: "With the smaller press brakes, setup time is cut to a third of what it used to take. We get the same accuracy as on the big ones, excellent consistency and faster operation all the way around. We can set or change stops faster and form small pieces faster. And we can use less experienced operators, if necessary."

The 25-ton press brake has been found to be very good for punching with Wales Strippit punches and dies. According to Cook, the machine "has been used quite a bit lately for punching holes in aluminum window frames."

Tolerances are important at Flour City and are held fine. In corrugation work the tolerance is plus or minus .007 inch.

Foreman Phil Cook inspects corrugated piece completed by operator. Tolerance which Flour City holds on work is plus or minus .007 inch.



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Rolls of fiber glass move up power conveyor from delivery truck through doorway cut in building. From here, rolls are carried into loft by a roller conveyor and are then stacked adjacent to metal chute which will carry them to final assembly. (Below) — Rolls are stacked in what was once an unused balcony. From here the rolls are placed on metal chute in window at left, where they roll to the cutting table.

Handling fiber glass at Fowler

DRASIC REDUCTION OF COSTS of unloading, storing and moving rolls of fiber glass used in the insulation of its electric water heaters has been effected at the Fowler Mfg. Co., Portland, Ore., a division of Republic Transcon Industries, Inc., Beverly Hills, Calif.

Prior to the installation of the new, cost-cutting setup, Fowler purchased its insulation from outside sources and had it brought to the plant in boxcar loads of 480 rolls to the car.

The boxcar, spotted on a spur alongside the building, was unloaded by Fowler men. It took two men eight hours to unload and store a boxcar load of insulation rolls.

With the new arrangement, the insulation is delivered by the truckload, approximately 520 rolls of fiber glass per truck. A previously vacant and unused balcony area above the offices was modified for storage of the insulation. In order to unload and store the insulation in this space a doorway was cut above one office.

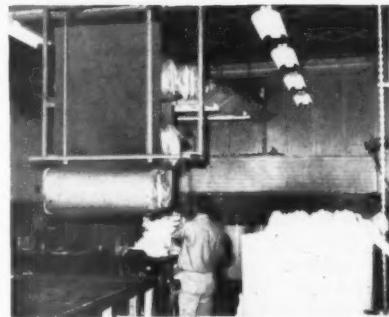
When a truck is to be unloaded, a 30-ft continuous belt conveyor is pulled out of this doorway from a track in the balcony and a lift truck lowers one end of it to the tailgate of the truck.

The truck carries two men who unload the truck by placing the insulation rolls on the conveyor. Two Fowler men in the balcony remove and stack the rolls in an immediate area. It takes only two hours to unload and store 520 rolls.

This resulted in a saving of 12 man hours, or \$30 per load — an annual saving of \$1500 in labor alone.

Further savings are realized in moving the fiber glass rolls from storage to final assemblyline where they are needed. Under the old setup the rolls had to be carted or carried from where they were stored at one side of the building through assembly areas.

Under the new arrangement, the bal-



Workman hooks rope onto last roll of fiber glass stacked on gravity chute leading from storage to final assembly. When needed, a pull on the rope feeds a roll onto the cutting table.

cny storage space is adjacent to, but immediately back and above, the final assemblyline. To convey the insulation rolls to the assemblyline, a gravity-type steel chute was constructed between the balcony and the cutting table. Periodically throughout the day, the chute is loaded with rolls of insulation. A roll is fed to the cutting table as needed by a simple device: a rope is attached to the top roll, at the upper end of the chute. A pull on this rope by the man at the cutting table forces the front roll to drop down onto the table.

In this way, there is no carrying of fiber glass. No man hours or labor costs are involved. The annual savings in moving the fiber glass rolls is \$3000. The plant now saves \$4500 annually on unloading, storing and moving the rolls.

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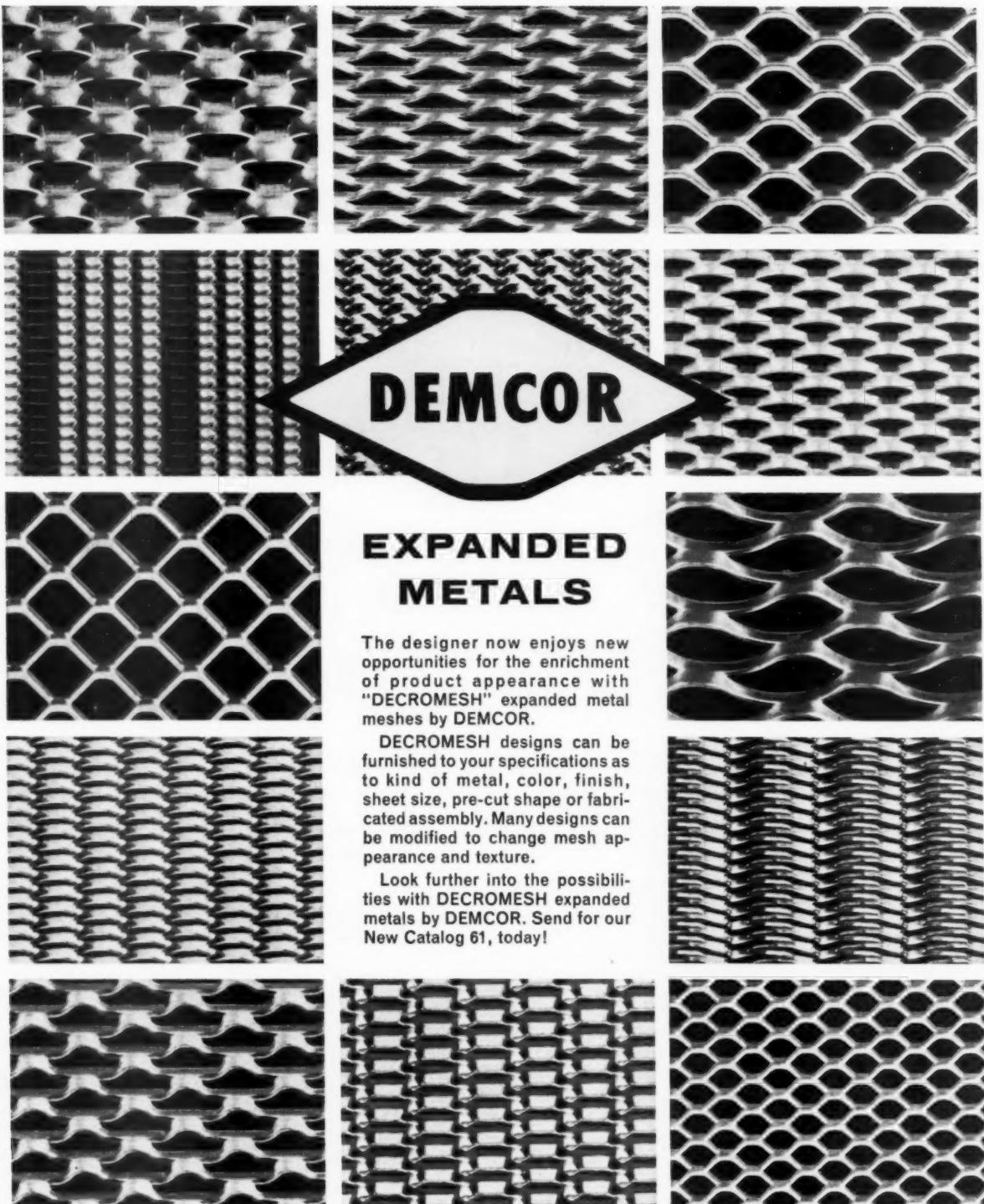
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Aluminum presents new challenge for cooking utensils

new "jewel-hard" coating also under development for architectural panels, plumbing fixtures, food processing equipment and household appliances

THIS REPRESENTS THE INITIAL description of a new "hardcoat" aluminum oxide coating which, according to extensive tests, approaches the hardness of corundum. This new aluminum oxide coating differs from standard anodized aluminum in being denser, thicker, harder, less transparent, and more corrosion and wear resistant.

While the initial development and testing program centered around its uses for cooking utensils, as a challenge to stainless steel or special glass and ceramics, Reynolds Metals Co. reports current development programs for household appliances, architectural panels, plumbing fixtures, food processing equipment, etc.

Colors to be offered in the "hardcoatings" range in shades of deep grays, blacks and bronzes, according to alloying constituents of the metal, thickness of coating, and pretreatment. Some hard-coats may be tinted and dyed by use of special dyes and wetting agents; for example, gold and red dyes have been used.

While coatings in excess of .001-in. are rare in normal anodizing, coating thicknesses of .015-in. have been developed by this process. Most desirable hardcoat film thickness for cooking utensils is indicated as .002-in.

The hardness of the coating is in the range of 7.0-8.5 on the Mohs scale, and abrasion resistance greater than chromium is claimed if provision is made for dissipation of localized heat.

A technical report by Kenneth H. Dale of Reynolds' Product Development Dept. reports extensive laboratory tests under severe cooking and cleaning cycles which are known to have a deleterious effect on cooking utensils. The hardcoated aluminum utensils were reported as unaffected by boiling citric, lactic and acetic acids, and boiling salt solution. Mixtures of tomatoes, tomato catsup, vinegar, salt, mustard, horseradish, red pepper and black pepper were cooked to dryness, and then allowed to char in the utensils.

In reporting on cleansing tests, it is

indicated that the materials were ultimately allowed to burn or char to make the severest cleaning necessary. Brillo pads, steel wool and Ajax cleanser were used in the tests without materially affecting the original surface appearance of the utensils.

The report also states that hardcoated utensils inspected after a year's service in homes have been found to retain their original appearance and, as a matter of fact, the action of abrasive cleaners is reported to have a polishing effect which adds depth and luster to this type of coating.

It is stated that the hard anodic coating improves the rigidity of the aluminum at high temperature, without mate-

rially affecting the thermal transmission characteristics of the base metal. Alkaline resistance can be built in the oxide film by impregnation with silicones, but is not considered necessary for normal cooking requirements.

Pretreatments, both mechanical and chemical, are suggested for special effects, including scratch brushing, etching, polishing, and grain highlighting.

As a result of the testing program, the following claims are made for hardcoating on aluminum cooking utensils: the coating is not affected by hot acidic foods or salt solutions; it is not scratched or abraded by scouring pads or abrasive cleaners; and it maintains high thermal conductivity. MPM

Appearance of hardcoated aluminum cooking utensils of various film thicknesses after 30 cooking and cleaning cycles. Pan #30 has a hardness thickness of .005-in. and shows slight discoloration at inside edge. Pan #29, with a thickness of .0025-in., and pan #28, with a thickness of .0015-in., show no change in original appearance.





Mark Eggleston, manager of cost and interchangeability, is pictured during a Dictet interview with MPM editors.

MPM PHOTOS

AN MPM STAFF FEATURE

WHAT ROLE DOES STANDARDIZATION PLAY in the operation of a distribution center for appliance replacement parts? At Whirlpool's La Porte, Ind. Service Center, a standardization (or "interchangeability") program makes a profitable contribution.

Through a series of "interchange studies," the firm's Interchangeability and Engineering Services Dept. has, in many cases, significantly reduced the number of different parts required to service a given type of appliance.

The program has resulted in cost savings and increased efficiency in several areas:

- Chances of having a specific part available, either at the Service Centers or on the distributors shelves, are greatly improved — the likelihood of availability increases as the quantity of different parts decreases.
- Inventory control procedures are simplified and the demand on storage space is eased. These factors are generally reflected in lower unit costs. In some cases, parts standardization also frees storage space for tools that can be obsoleted through the program.
- By substituting a few parts for many, it is usually possible to take advantage of longer production runs and resulting lower costs. In some instances it is possible to utilize a current production part as a substitute for other models, and even greater savings accrue.
- When it is feasible to substitute a current part for a series of older models, quality and reliability are often enhanced because of the up-to-date materials and design features in the current part.
- Occasionally it is necessary to set up old, practically obsolete tooling in order to produce a part which was originally manufactured several years earlier. If a currently available part can be substituted for the older model, savings are significant.
- Results of some interchange studies indicate that more than one part (supplied by different vendors) can be used for the same application. Assuming quality is equal, the most economical part is selected.

Impressive results

A look at a summary of the Service Center's standardization progress in the period from 1954 through 1960 clearly

Improving appliance servicing through standardization

interchangeability program at Whirlpool's parts distribution center lowers cost, improves efficiency

demonstrates the value of the interchangeability concept. In this period, when approximately 17,500 new parts were released to the service parts system, 4165 interchange studies were completed and approved. These studies resulted in the replacement of 4960 parts through substitution.

In home laundry equipment, for example, one major study resulted in the replacement of 59 different tub cover assemblies by only nine assemblies. Forty-nine inlet valves were replaced by one valve and 11 adapter kits. Sequence timers numbered 186 before an interchange study was undertaken; the results of the study showed that 114 timers (or timers plus kits) could replace the 186 individual timers. Also, it was determined that 14 burners for gas dryers could be reduced to only three burners and three adapter kits.

Further evidence of the program's effectiveness lies in the results of interchange studies on Whirlpool's vacuum cleaner line. A total of 301 components, representing six categories of parts, were examined for standardization possibilities. The completed studies chopped the figure down to 23 components: 3 hoses replaced 157 which were previously stocked; 11 rug nozzles replaced 17; 7 floor nozzles replaced 19; 1 dusting brush replaced 49; and 1 upright sweeper handle replaced 59.

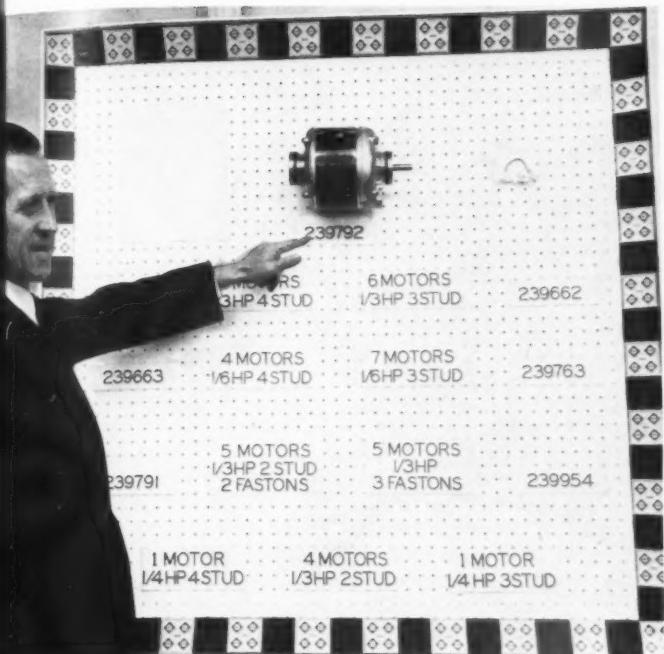
Some of this interchangeability was achieved by standardizing on color and/or styling as well as engineering design. One firm restriction of this policy, however, is that no colors may be "obsolete" through standardization until two years after the final production of a model on which a particular color is used. If a new color on a vacuum cleaner handle were introduced on a 1960 model, for instance, handles in that particular color would be stocked until 1963.

The staff responsible for the interchange studies at La Porte consists of 18 persons, headed by Mark Eggleston, manager of cost and interchangeability, and George Muhlbradt, manager of interchangeability.

Responsibilities within the department are currently divided on the basis of product — refrigeration, ranges, laundry, etc. According to Muhlbradt, however, a transition

As indicated in previous installments of MPM's standardization series, there are opportunities for action in this area both at OEM and supplier levels. Within each of these two groups, standardization efforts can be aimed in several directions. The performance of Whirlpool's Interchangeability and Engineering Services Dept. at the firm's La Porte, Ind. Service Center points up the desirability, if not the necessity, of a standardization program in a service parts operation. (See the February 1961 issue of MPM for a complete story on the La Porte facility.)

STANDARDIZATION SERIES



SUMMARY OF WHIRLPOOL MAJOR INTERCHANGE STUDIES IN THREE PRODUCT AREAS 1954-1960

"A" LAUNDRY APPLIANCES
"B" VACUUM CLEANERS
"C" REFRIGERATORS-FREEZERS

Original number of different parts on which interchange studies were conducted

Number of different parts remaining after interchange studies were completed

799
"C"

460

"A"

301

"B"

365

ULTIMATE INTERCHANGEABILITY — George Muhlbradt, manager of interchangeability, points to motor which is produced as a replacement part for any electric clothes dryer ever built by Whirlpool. Adapter kit to right of motor contains installation instructions, a jumper wire for use in some of the two and three-stud motors, and terminal adapters for harness leads.

● Below the "ultimate" motor are cards showing the motors which have been replaced in the study — a total of 44. Before the final step toward ultimate interchangeability, six motors plus adapter kits were stocked as the result of a previous interchange study.

● The surviving motor is a four-terminal type, having two stud-type and two push-on ("fastons") connections, so that it can be used to replace motors of either type. The motor is substituted for other models of varying horsepower — from 1/6 to 1/3 hp. The replacement motor is a 1/3-hp model, illustrating the point that it is often economical, because of production quantities, to use a part which will have excess capacity in some applications.

is currently underway that will eventually result in specialization by component type. Parts will be categorized in broad functions: timers, thermostats, gaskets, etc.

Requests for interchange studies may originate within the Interchangeability and Engineering Dept. or be suggested by other persons who feel a study is warranted. Thus, the study requests may come from distributors and dealers, as well as from the Service Center staff.

General procedure

The general procedure followed in determining the feasibility of parts interchange is first to look for similarities or "common denominators" among the parts in the group under study. Next, the parts are scrutinized from the standpoint of specific characteristics, such as mechanical and electrical requirements. Then such factors as size, surrounding components and mounting techniques are considered.

When it is decided that a degree of standardization is practical on a group of parts, possibly with the aid of adapting devices, an appropriate engineering specialist in one of Whirlpool's divisions is consulted regarding the proposed action. The specialist may be an electrical engineer intimately acquainted with the products in question. He studies the project in order to detect any technical weakness which may have been overlooked.

After the interchangeability program passes this stage, it is studied from a cost angle by the planning department. When final approval is granted, files and individual part record cards are adjusted to show which parts have been "obsolete" and which have been retained as substitutes.

Ultimate interchangeability

Despite the success of the interchangeability program to date, the company's Service Center management is initiating further refinements in the system. High on the list of future goals is a plan termed "ultimate interchangeability." Already in effect on a few product lines, ultimate interchangeability is described by Eggleston as "a program which reduces the number of parts of a specific type down to the lowest number of stock-keeping units possible; this is followed by the final step of designing and producing a 'universal' replacement part which eventually is substituted for all previous parts."

Obviously, Whirlpool does not expect the program to reach the "ultimate" stage in every case. Conceivably, several



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parts may make up the universal replacement "team," depending on the type of part and the varieties of applications it serves in the firm's appliances.

Ultimate interchangeability differs from the present standardization program in that the present program makes use of currently existing parts which are substituted for others in the line, often with the use of adapting devices such as mounting brackets, electrical connections, etc. Ultimate interchangeability, on the other hand, is based on a *new design*, incorporating features which make it universally applicable within its line of parts. A redesign is necessary because it is virtually impossible to find a universal part among existing models.

An example

Although the ultimate interchangeability concept is relatively new to the Service Center, some progress has already been made. One major line in which the plan has made tremendous headway is compressors for refrigerators, air conditioners and freezers.

In the period from 1947 to 1958, the service program for compressor systems was on a unit basis. When service was required, the complete sealed units were returned to the Service Center or to repair stations throughout the country. This often resulted in long delays before the appliance could be put back in operation. During this period, there were approximately 216 different sealed compressor units in use.

In 1956, a "component repair program" was initiated for the compressor systems on a controlled basis. This program allowed the repair of units in the field by using component repair parts, as opposed to servicing the compressor as a complete unit.

The plan was adopted fully in 1959. Since the compressor itself is the major component in the sealed system, it was necessary to stock numerous varieties of compressors. The service organization realized that in succeeding years basic compressor design changes would probably occur, or that capacity requirements would change. It was recognized that new compressors would have to be substituted for the old, when possible, in order to maintain a minimum number of compressors for service needs.

Therefore, a study was undertaken which resulted in a reduction of the different types of compressors to 17, in addition to 146 component kits containing mounting parts and certain small electrical assemblies.

The next phase in the compressor program is ultimate interchangeability. Plans are now being completed to produce "universal square" compressors in seven varieties. These units will meet the needs of all field replacements, and will also reduce the number of component kit groups. It is likely that the "universal seven" will become part of the replacement parts system by the end of this year.

Whirlpool estimates that, if no efforts at standardizing service compressors had been made, the warehouses would bulge with varying quantities of 450 different compressors.

Codification — an important tool

One of the major tools of the expanded ultimate interchangeability program will be "codification." All parts in the service system will be assigned a code number by category and "family grouping." For example, switches would be called a category; family groupings within the category would be float switches, pressure switches, toggle switches, etc. Applications of the switches within each family code would often cross product lines.

The code data will be fed into electronic computing equipment. When information is desired on any specific category

or family of parts, the computing equipment would quickly provide a listing of all parts falling under the desired code. Thus, there is no possibility of some part being overlooked when an interchangeability study is conducted.

An additional step in the codification procedure will be the compilation of standardization "catalogs," which will show the results of interchangeability studies and all the parts involved.

Working at design level

It is expected that these catalogs will be further utilized at the appliance design level of the company's operations. Engineers and designers would use the publications as a guide to determine whether a standardized part or assembly could be used on a future production model. Currently, this function is handled informally, with the Service Center sending representatives to design departments to make suggestions on employing currently available parts in new models.

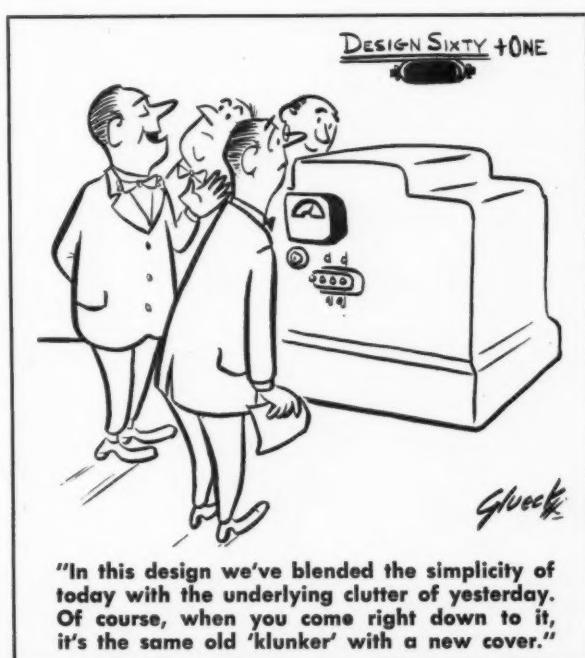
Aside from the value of the standardization catalogs specifically within the Interchangeability and Engineering Services Dept., the material is to be used when consulting with engineering departments of suppliers to develop universal service assemblies.

Long-range objective

One of the related aims of the ultimate interchangeability program, as mentioned earlier, is to cooperate closely with the designers of new appliance models to determine whether existing parts in the service system can be utilized in the new models. By careful attention to standardization possibilities, the company feels that parts interchangeability can be built into many new products without stifling creativity.

This phase of the program is naturally long-range in nature. As it gradually takes effect, however, the spare parts distribution system will become even more capable of providing efficient appliance servicing and product reliability.

MPM STANDARDIZATION SERIES POLICY: *It will not be our plan to use information which would tend to stifle improvement of products or logical model changes which offer the end product purchaser added use value.*





4

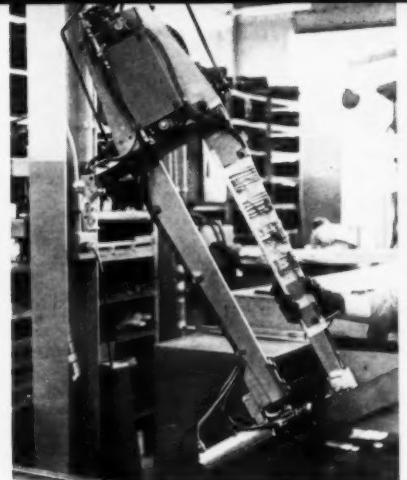


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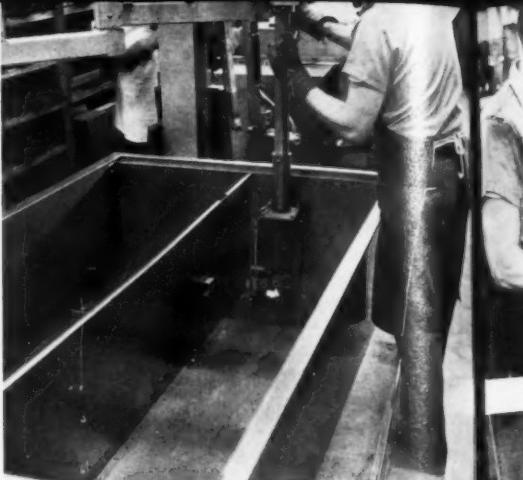


5

1 — First step in fabrication of hospital cabinet is welding the cabinet sides to the back with the dual-point series welder used exclusively for flat work. Two spot welds are made simultaneously with each impulse. Note integrally-mounted power transformer and "pantograph" arms for positioning the welder. Welding on left side has been completed.

2 — Top and bottom sections of cabinet are added next with same welding unit. Note extended "pantograph" arms. Current-actuating button is located on positioning handle being held by operator.

3 — Following assembly of end panels, the



6

flange corners of cabinet are lap welded with the 7-in. adjustable-throat unit, which is the smallest and most maneuverable of the three welding heads. Resulting seam is later brazed and ground smooth to give a good finished appearance.

4 — Deep-throat or "scissors" welder is then utilized to make the vertical seam welds joining the cabinet sides to the end panels.

5 — Full-length view of deep-throat welder. Note power transformer at top of unit.

6 — Center partition is then placed in cabinet and welded to back with dual-point welder.

Welding "monster" gives St. Charles ef

custom-built recessed steel cabinets for schools and hospitals fab

AN MPM STAFF FEATURE

THE BUSINESS OF MANUFACTURING steel cabinets for homes, schools and hospitals on a "by-order" basis requires production techniques that are unorthodox in comparison to contemporary mass-production methods.

The St. Charles Mfg. Co., St. Charles, Ill., maintains no inventory of finished products. When an order for cabinets and accessories is received through one of the firm's dealers, production machinery is set in motion to produce the units to the exact size, shape and color specifications of the customer.

Custom building of this nature demands equipment that is flexible yet efficient. Representative of such equipment is a spot welding unit recently built for St. Charles to fabricate recessed steel cabinets for schools and hospitals.

Because of its size and imposing appearance, the welding unit is described as "the monster" by shop personnel. The term is not derogatory, however, for this "nice" monster has enabled the company to weld the large cabinets faster and

with a higher degree of efficiency than by welding methods previously in use.

The size of the cabinets produced range up to 57 in. in width and 83 in. high. Before the new welding equipment was installed, the work was done on equipment designed for smaller casework. Handling was excessive, as it was necessary to "bring the cabinet to the welder" to accomplish the welding.

The current equipment, on the other hand, allows two operators to complete all welding without shifting the position of the cabinet. The work is placed on a 60 by 90-in. copper shunt bed, and all welds are made by bringing the welding equipment to the cabinet — no turning or repositioning is necessary.

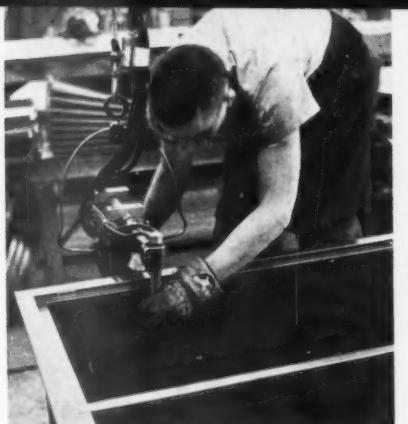
The spot welding equipment itself consists of three individual welding units — each designed for specific welding assignments. Mounted on a common center pole, the welders are highly maneuverable. Two of the welding heads are mounted on booms: a deep-throat or "scissors" welder used to weld vertical seams; and a 7-in. adjustable-throat unit employed to weld corners, shelves, etc.

The third welder, a dual-point series



7

↓ 8



9 — Door stile is welded to side of cabinet with adjustable-throat welder.

10 — Completely welded cabinet ready for finishing and final assembly. Wood cleats on base of cabinet act as skids for handling.



10

MPM PHOTOS

DRAWING COURTESY COOPER WELDERS, INC.

Cabinets efficiency, versatility

ital: fabricated with specialized equipment

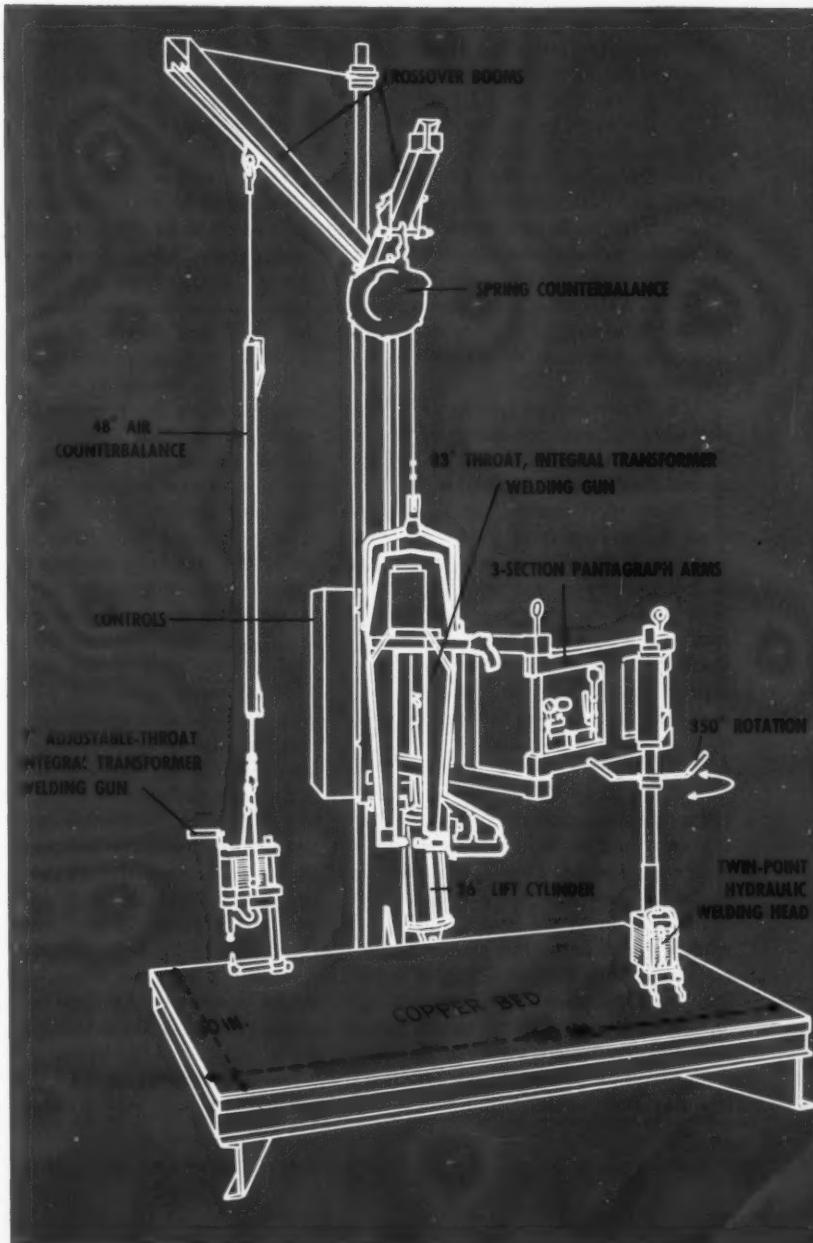
unit utilized for flat work, is mounted on a system of jointed "pantagraph" arms, which allow the welding head to be positioned in any spot on the copper work surface. In addition, the welding head can be pivoted 350 degrees and the entire unit can be retracted 33 in. vertically.

An outstanding design feature of the equipment is that each welder is equipped with its own compact power transformer, in contrast to single, bulky transformers normally associated with this type of equipment.

The hospital and school recessed cabinets are generally constructed of 18-gage steel, although the welding equipment is capable of handling stock up to 16 gage. The stock from which the cabinets are made is held to tolerances of $1/64$ in. throughout press room operations. This enables the welding department to fabricate the cabinets without the aid of special jigs and fixtures, as is necessary in many production shops.

The accompanying set of photographs demonstrates the versatility and efficiency of the equipment in welding a hospital cabinet of 18-gage steel.

MPM



Kelvinator employs reciprocating bell atomizers in new "senior" finishing system

refrigerator parts painted with automatic electrostatic equipment

COMPLETE PLANT FACILITIES of Kelvinator's plant at Grand Rapids, Mich., were described in a special 48-page section that formed the center of MPM's May 1960 issue.

Included in this comprehensive coverage was a description of the firm's organic finishing system for its line of appliances. The following excerpts from the story describe the refrigerator finishing system at that time:

"As the ware leaves the dryoff oven, it is transferred to conveyor arms supported by an underfloor conveyor system. The undercarriage is a tricycle which rides under the floor to support a single, tubular ware carrier which travels through a slot in the floor."

"What Kelvinator plant men term the 'senior' finishing system is a setup geared to take care of the all-white requirements."

"The tricycle-type conveyor carries the ware (in sets consisting of two refrigerator cabinets and two doors) into an enclosed, pressurized room."

"At the first station, an operator in a pit below floor level sprays the under section of the cabinets and parts. This is followed by a staggered booth with four operators, two on each side, for spot or touchup spraying the fronts and backs of cabinets. Then comes a three-station, automatic, reciprocating spray unit, the first to coat the right side of all ware, the second to coat the left side, and the third for coating the tops of the ware. The automatic spray equipment setup has three guns on each reciprocating arm, and there is a second set of staggered, manual booths, with one operator on each side for final touchup."

In addition to the main line for all-white cabinet parts, the article detailed a second, more flexible ("junior") line for the application of colors and for finishing all miscellaneous parts which were not readily adaptable to the automatic, high-production spray line.

Today the "senior" line has a new

look. In a move to gain a high degree of automation without sacrificing flexibility, the company has installed a system of electrostatic bell atomizers with automatic controls for triggering and repositioning.

Flexibility is required because Kelvinator's four basic refrigerator models range in size from the big, two-door Foodarama (64 by 41 by 24 in.) to the small model (36 by 24 by 24 in.). The new equipment automatically applies a uniform 1.8 to 1.9 mils coating on all parts, regardless of size variation.

Changeover to electrostatic painting on the all-white "senior" line involved major remodeling. Five water-wash spray booths were removed; a new ventilating system was installed, as was an additional length of conveyor and a newly designed indexing system.

The floor conveyor, which has been retained from the previous system, operates at speeds of 12 to 24 fpm. Workholder centers were changed from 48 to 56 in. to better accommodate the varying sized articles.

A circulating line from the outside paint mix building supplies the enamel into a 55-gallon drum in the paint room. A separate circulating system takes it from the drum, through heaters, filters and into the electrostatic units.

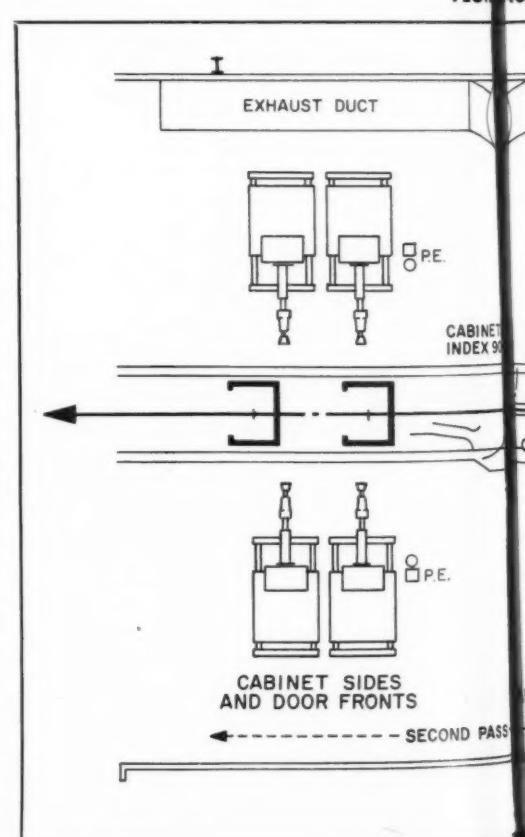
Immediately preceding the automatic equipment is a pit booth where two operators hand spray bottom rails, bottom panels and front edges of the cabinets.

Sides of the cabinet shells and doors are painted at the first electrostatic stations where there are four reciprocating units, two on each side of the line. Each unit consists of three atomizing bells mounted in a vertical line, one above the other. The 4-in. bells, rotating at 900 rpm, move up and down on a short stroke to apply the uniform coating electrostatically. And, as different-sized parts move in front of the painting units, the bells — controlled by limit switches — are automatically moved back and forth

from the work to maintain the proper distance from the ware, which in this instance is about 13 in. Paint is triggered on and off automatically by electric eyes.

As the cabinets move toward the second electrostatic spray station, they are indexed by an especially designed dolly system, controlled by an outboard wheel and cam. Doors are not indexed, but go straight through the line.

At the second station, backs of the cabinets only are painted by one reciprocating unit of three bells. Limit switches



again control the proper distance between atomizers and the cabinets. At the same time, three stationary bells mounted overhead apply the first coating to cabinet tops. Paint is also triggered off and on by electric eye controls.

After a short flash-off, paint is automatically triggered on for another application to cabinet tops with an additional set of three stationary bells mounted overhead.

Before entering the final electrostatic station (which is identical to the first station), cabinets are indexed back to original position for another coating on the sides. Hand touchup to some areas in a second booth completes the painting process.

The conveyor then carries the sprayed ware to an on-the-roof oven for a 30-minute bake at 300 F. The baking operation is unchanged from the procedure described in the May 1960 issue of MPM.

Moving bell atomizers automatically paint mixed sizes of refrigerator cabinets and doors on Kelvinator's modernized finishing line. Electric eyes selectively trigger the paint on and off between parts, and limit switches re-position the electrostatic painting units to accommodate different size cabinets and doors on the same production line.

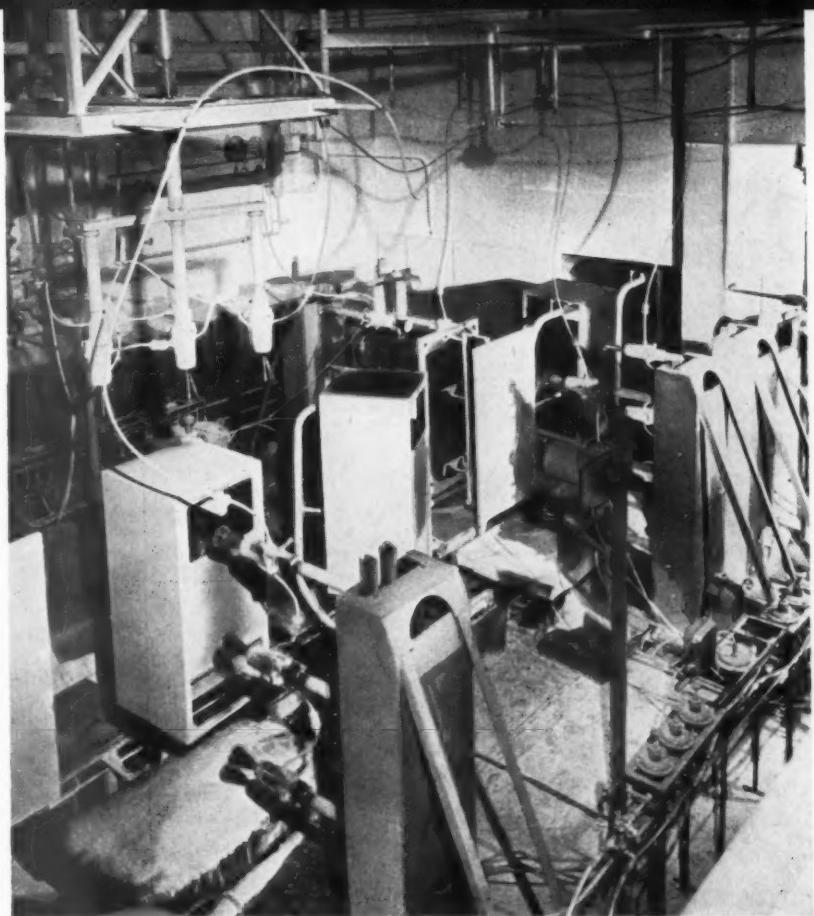
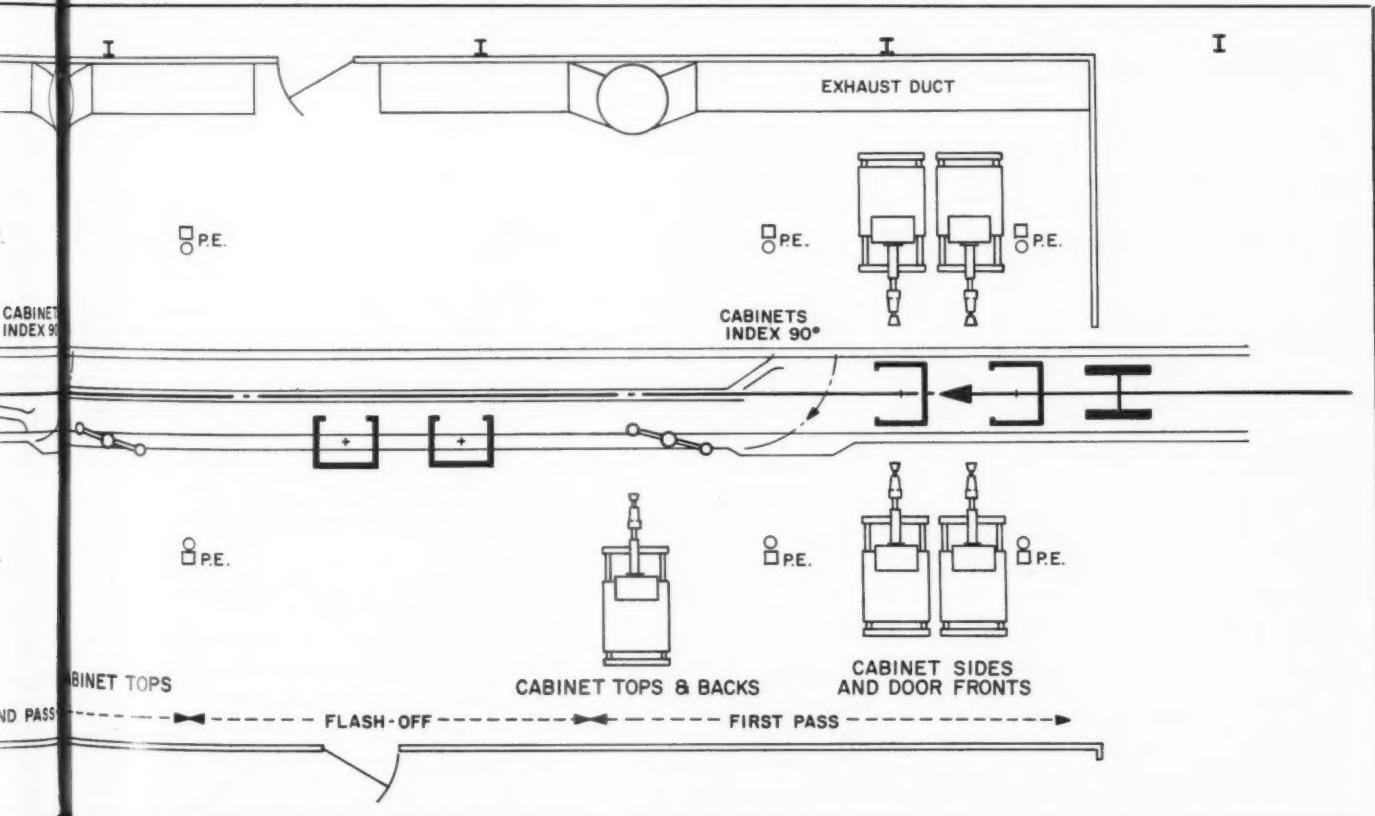
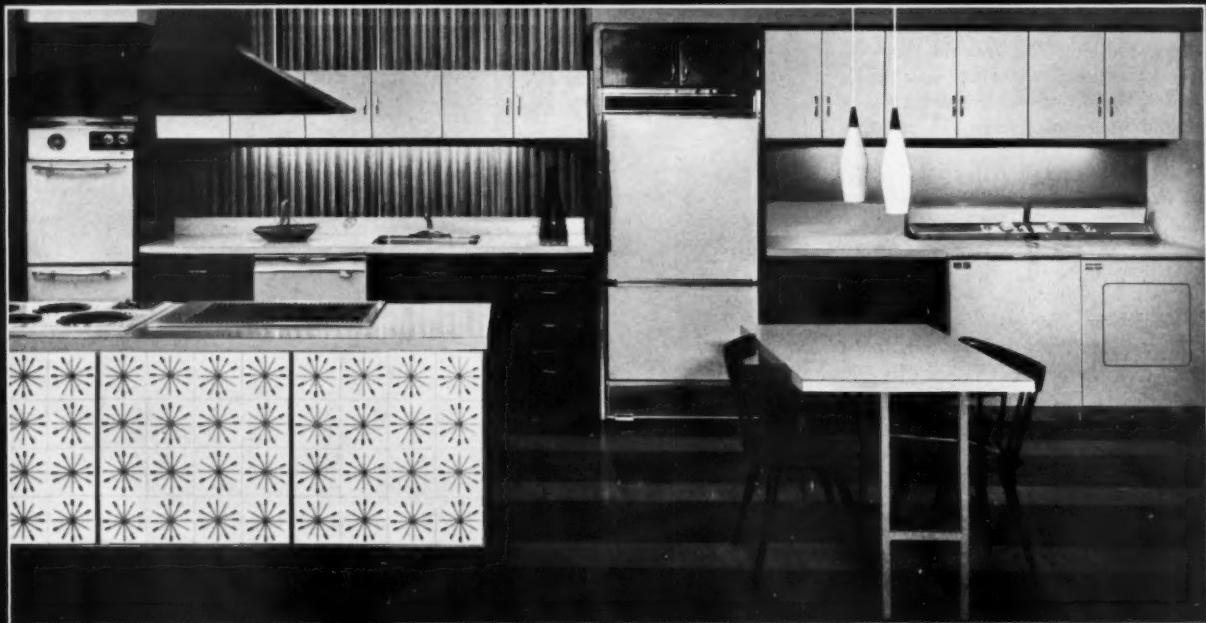


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FLOW DIAGRAM OF KELVINATOR'S MODERNIZED ORGANIC FINISHING SYSTEM





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TAKE MODERN STEEL—particularly in any of the forms mentioned above. For full details, write Weirton Steel Company, Weirton, West Virginia.

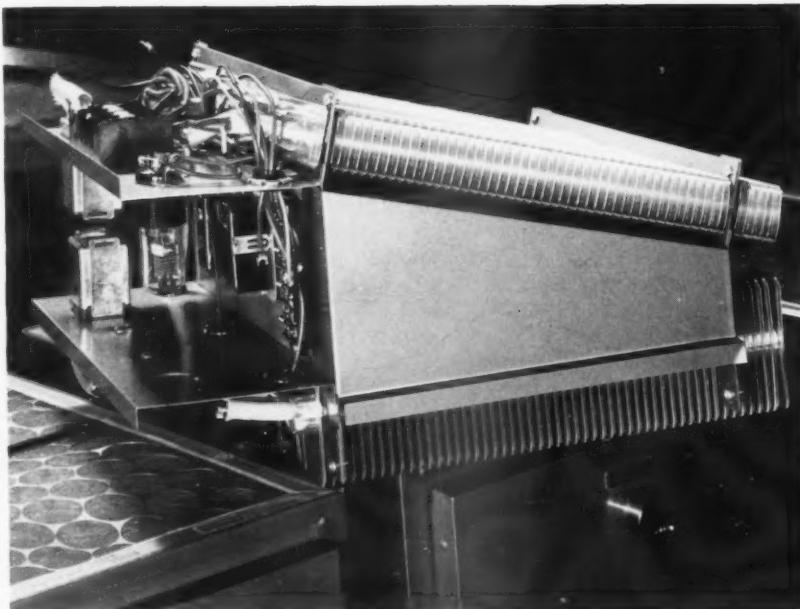
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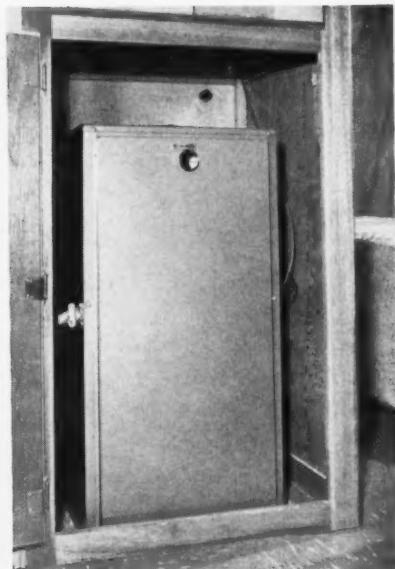
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A compact electric furnace for mobile homes



Closeup of the heat exchanger — the heart of the new mobile home electric heating unit.



Compact electric furnace shown installed in mobile home. The unit measures 15 in. in width, 21 in. in depth and 30 in. in height.

AN MPM DESIGN FEATURE

TO DESIGN AND BUILD a compact, safe and easily serviceable electric furnace — specifically designed for mobile home heating — was the objective of Ramco Mfg. and Engineering Co., Portland, Ore. With compactness an all-important requirement for even the largest house trailers, the company had in mind a small package unit — one that would take only about one-third the space of most mobile home oil heaters.

Since the unit would need to be housed in a restricted space, Ramco wanted one that could be easily installed and serviced. The unit would need to be designed so that it could be readily installed either on the production line for new mobile homes or in the heating compartments of existing mobile homes. Quiet running was considered essential.

The company conducted a field survey to determine what was wanted in this type of heating unit. The survey included both insurance companies and power companies. It was planned to design a unit that would meet the re-

quirements of Underwriters' Laboratory, Mobile Home Manufacturers Association, and Trailer Coach Association.

Ramco had a background of some 18 years of experience in the design of baseboard electric heating units and other electric heating equipment. The result of this latest design project is a mobile home furnace 15 in. wide, 21 in. deep, and 30 in. high. One of the features of the new design is an exclusive aluminum fin heat exchanger. There are no open coil elements. A high-temperature ceramic core is sealed for safety. The aluminum fin design distributes heat quickly with the help of automatic fan cycling. A time delay splits the load into two stages — one-half load on each stage to eliminate line surge. A low-voltage thermostat maintains temperature settings with close cycling. When the current shuts off, heat stored in the ceramic core is circulated by continued fan action.

The fan has three speeds, and controls are adjustable for all weather needs. A separate "summer" fan switch is included. The furnace is designed for easy attachment of an air conditioning unit

and is adapted to fit existing duct work. The blower uses direct drive. The entire control system section slides out on a track for easy accessibility.

The furnace is pre-wired in the factory for installation on 220 service. A quick-connect terminal block is used. Company engineers say that the unit can be installed and in operation in 30 min.

The body and principal components, including the heat exchanger, are fabricated in the Ramco plant. The body parts are 20-gauge cold rolled steel. The fin-and-tube units are produced on a new automatic machine. The exterior finish is iridescent baked enamel.

The furnace is built in two models, 8 kw and 10 kw, with Btu outputs of 27,305 and 34,130, respectively.

According to company officials, the response to the furnace has been better than anticipated, with quality coach manufacturers beginning to use the unit as standard equipment. It is also being suggested for small homes, offices, schools, etc. The company is working on a contract to supply 1100 of the electric furnaces for a large retirement home project. MPM

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LOOK AHEAD WITH LEAD

Strain gages for evaluating stresses in porcelain enameled products

BY **Glenn E. Selby** • SENIOR METALLURGIST,
ARMCO STEEL CORP.

THE PAST 20 YEARS has seen tremendous advances in the field of stress analysis. Although applications of wire resistance strain gages have generally been limited to metallic surfaces, today the use of these devices to evaluate residual and applied stresses in porcelain enameled products is an accepted practice.

Stress development and its effect on finished products have always been of prime interest to porcelain enamelers. Many hours of research have been spent attempting to correlate stress with the thermal expansion of porcelain enamel coatings and their base metals.

The desirability of applying a coating with a coefficient of thermal expansion lower than the base metal has been emphasized in all reports based on this research. Consequently, the concept of compression stresses in porcelain enamel coatings was developed. Awareness of this concept is necessary in designing porcelain enameled products.

At the same time, it is recognized that many of the common enameling problems — such as spalling, crazing and warpage — are associated with concentrations of stress caused by design and/or processing variables, both of which are beyond the concepts of thermal expansion stresses. In this area, however, the measurement of stresses on the finished product offers additional information to the designer and manufacturer to assist him in making a satisfactory finished product.

Operation principle

Operation of the wire resistance strain gage is based on the principle that electrical resistance of certain wires varies with the amount of tension on the wire. This phenomenon, first uncovered by Lord Kelvin in 1856, was virtually "dormant" until 1939. Then, E. E. Simmons

of California Institute of Technology and A. C. Ruge of Massachusetts Institute of Technology almost simultaneously developed techniques for bonding a length of fine wire to the surface to be investigated so that any and all of the surface strains could be directly transmitted to and measured by the wire itself.

How is this technique being used today? Here is a typical example; A serious chipping problem was being encountered in a porcelain enameled dishwasher interior when the pump housing was bolted to the enameled interior. Some of the failures were the delayed type, making the problem even more serious.

Strain gages were installed in the areas where chipping occurred and initial readings were made on a static strain indicator. The pump housing was then attached in the usual manner and the resulting strains were measured. These readings were converted to stress and results showed that tension stresses

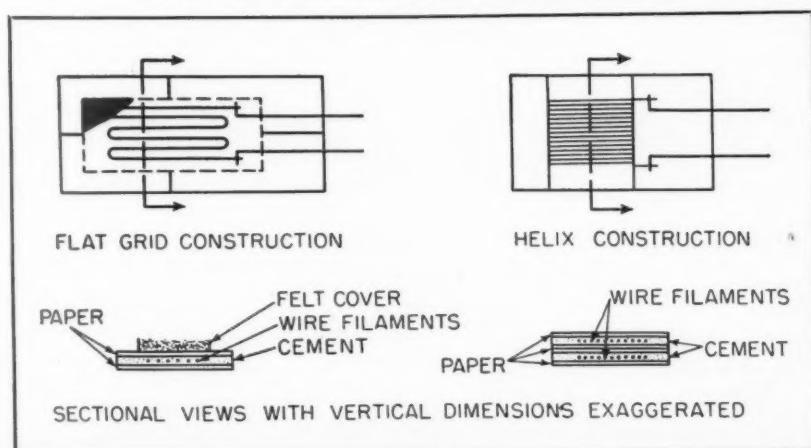
were developed at the critical locations because of the part's design. Removal of the web changed the entire pattern of stresses.

To understand the principle of wire resistance strain gages, it should be kept in mind that the gage is bonded intimately to the surface being tested, and the wire responds to the changes of that surface caused by applied forces, thermal forces and other forces.

Gage construction

The construction of a typical strain gage, the SR-4, consists basically of about 5 in. of 1-mil wire (usually of special-analysis metal) cemented between or on pieces of thin paper. The paper serves as the carrier and aids in handling the wire. The wire in the gage is actually in the form of a grid consisting of long parallel loops. In manufacturing, this grid is lowered onto a piece of thin paper (about the thickness and quality of cigarette paper) and fixed in place with a suitable cement. Larger

Two methods of SR-4 wire resistance strain gage construction.



diameter leads are welded to the ends of the grid wire and either a second piece of paper or a felt pad is cemented over the grid.

This completed assembly may be only the size of the common postage stamp. However, demands for the gages have been so varied that the manufacturer stocks over 300 different types of standard gages.

As stated earlier, the gage must be bonded intimately to the porcelain enameled surface. The smoothness of porcelain enamel presents some problems in this regard. Light sand blasting and etching of the surface prior to bonding are not recommended because of the resulting damage to the surface.

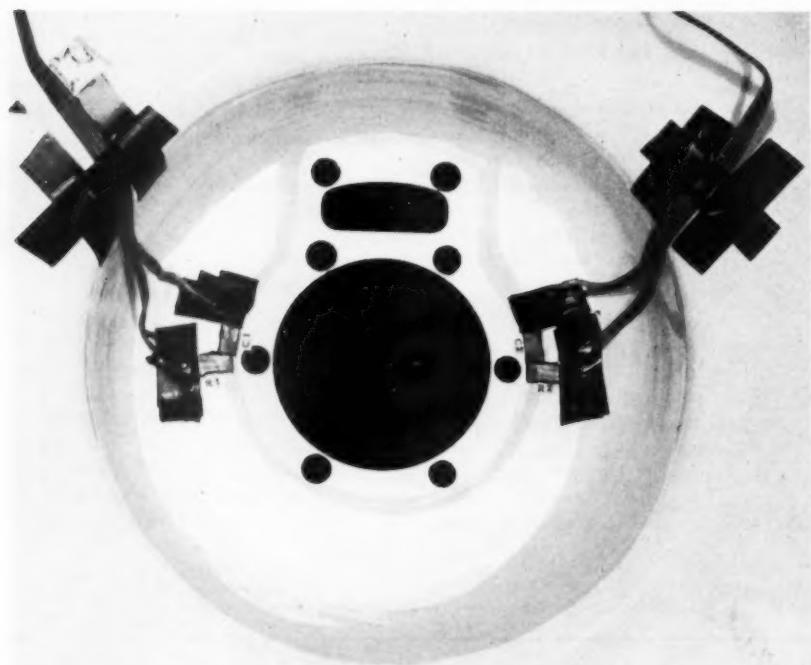
Bonding technique

However, adequate bonding can be achieved by following a few simple practices, keeping in mind the importance of cleanliness. A common type of

available strain gage is the nitrocellulose (or "Duco") gage. Bonding of these gages with Duco cement is accomplished by observing the following procedure:

1. Roughen the surface lightly with No. 0 emery paper.
2. Clean the surface thoroughly with acetone, carbon tetrachloride, or another volatile solvent.
3. Clean the underside of the strain gage with acetone. This must be done carefully in order not to damage the gage, since acetone is a solvent for Duco.
4. Apply a liberal amount of Duco to the porcelain enamel surface, and center the gage on the desired area.*

*In some cases it has been found that precoating the ceramic surface with a thin layer of cement, which has been diluted slightly with solvent, will form a sound adherent in preparation for the final coat and the strain gage.



(Above) — Strain gages were attached in the areas where serious chipping was occurring on a porcelain enameled dishwasher interior. The pump housing was then attached and the resulting strains were measured and converted to stress. (Below) — Table shows how removal of the web from dishwasher interior altered the stress pattern.

STRESSES IN ENAMELED DISHWASHER INTERIOR

Stresses in Enamelled Dishwasher Part*

	Location R1	Location C1	Location R2	Location C2
Original Design	+1920	-8280	+6360	-10440
Web Removed	-6240	+120	-3960	+1920

* — Denotes Compression. + Denotes Tension.

5. Squeeze excess cement from under the gage with the eraser end of a pencil to eliminate air bubbles. Gently press the gage from the center outward. This will produce a layer of cement about .001-in. thick.

6. Air dry for 24 hours.

Another method

These gages and those encased in a Bakelite film can also be bonded with Eastman 910 contact cement. Thorough cleansing of the surface is again paramount after light roughening of the surface with emery paper.

Following this, the procedure is as follows:

1. Apply a thin layer (.001 to .003-in. thick) of the cement using a paper clip or a cotton swab on a wooden stick. Do not apply pressure.
2. Apply a film of liquid accelerator (supplied with the cement) to the back side of the strain gage.
3. Place the activated gage on the surface by sticking one end of the gage in the desired location and gently rolling the finger over the gage. A piece of Teflon tape is generally used between the gage and the fingers to avoid skin contact with the cement.

Strain gages applied by either of these two methods have been used successfully.

Hairline cracking analysis

Another example of how wire resistance strain gages have been successfully employed involved porcelain enameled appliance cabinets. Hairline cracking of newly enameled covers was reported in areas around suspension points for the chassis and mechanical assembly of the appliance. SR-4 strain gages were applied to the cover in areas where cracking occurred, and also on the supporting interior brace.

At one suspension point, the gages were applied directly over the enamel. At a second suspension point, the enamel was removed by grinding and the gages applied to the base metal. After application of the gages, the sections were trepanned out and the residual stresses measured by noting the change in strain reading on a Baldwin Static Strain Indicator. Stresses were calculated from the strains and the modulus of elasticity involved.

Uses of these gages are limited only by the imagination of the experimenter and availability of materials.

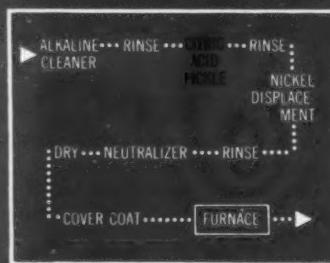
A more detailed paper on this subject by Glenn Selby appears in the Porcelain Enamel Institute Forum Proceedings, 1960 edition.

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Now, produce excellent, one-coat porcelain enamel finishes on metal surfaces. Your present equipment, only slightly modified, can bring you the advantages of an effective new direct-on development. Consider these features of the CITROBOND Process: 1. Simply use citric acid in place of sulfuric acid in the pickling bath 2. Dry, non-toxic, water-soluble, easy-to-handle Pfizer Citric Acid prepares the metal in a way that makes a ground coat unnecessary 3. No major installation of special equipment is required 4. Non-premium type steels can be used 5. Excellent results are obtained with new low carbon steels Let Pfizer send you all the information about this modern enameling technique. Clip and mail the convenient coupon now.



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*Process developed by W. G. Ray, Chas. Pfizer & Co., Inc. and Shipp C. Davis, Daco Corp.

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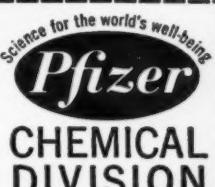
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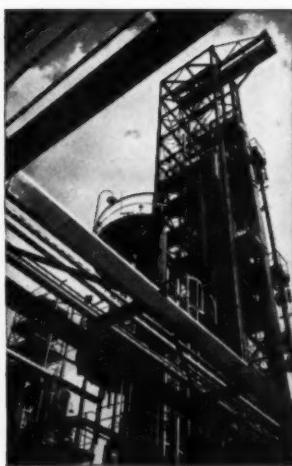
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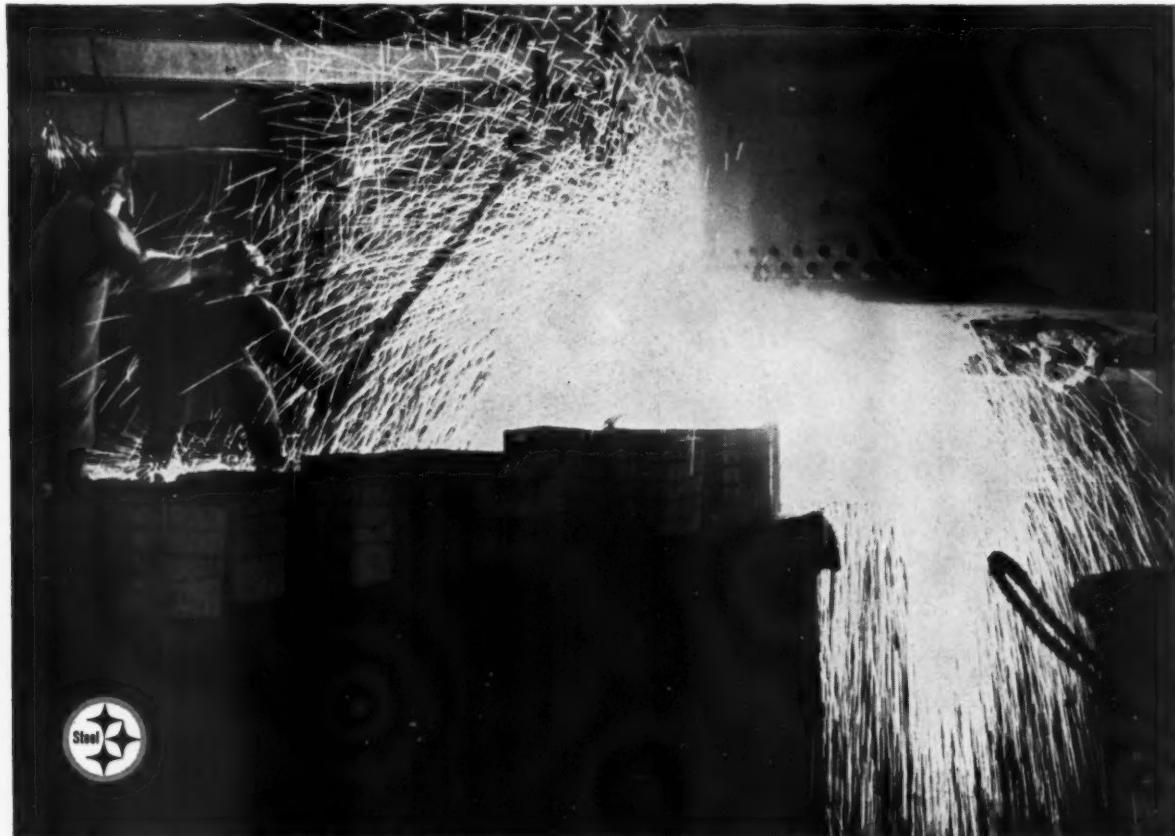


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quickly . . .**



Alan Wood has several decided advantages to offer users of steel plate, sheet and strip. Capacity for quality quickly is one of them. Another is dependable product performance stemming from meticulous quality control. And our "immediate-attention-to-orders" policy adds still another *plus* when you do business with Alan Wood.



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PERMA-VIEW[®] NON-FOG WINDOWS

ARE A SMALL PART OF YOUR OVEN

BUT A
BIG SALES
FEATURE



Modern homemakers in the market for a new range have become increasingly selective. They have come to prefer a range made more attractive by clearly visible cooking. Consumer's acceptance has made PERMA-VIEW America's largest selling range window.

The window is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." The NON-FOG window meets the demand for visible cooking, and the label is recognized by the consumer as a guarantee they can depend upon.

As a practical, economical and effective component, PERMA-VIEW can be your best sales feature. Be sure to take advantage of this feature in your new models—either free-standing or built-in, and let your prospective customers know it by using the label on all of your ranges.

MILLS PRODUCTS
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MPM

Industry news

Waste King Reports Profit

Waste King Corp. showed improvement in the second half of its past fiscal year and reported a profit in each of the first three months of the new fiscal year. Bertram Given, president of Waste King, said the company lost money for the year ended March 31, 1961, but showed a profit in March, April and May.

Given said the year's losses "were principally due to difficulty in the integration of Cribben and Sexton Co. and Waste King Corp. Cribben and Sexton, Chicago, is a wholly owned subsidiary. He pointed out that the improvements in the more recent period were made in



Shown in a recent MPM photo are Howard Given, executive vice president (left), and Bertram Given, president of Waste King Corp.

months customarily among the poorest in the appliance business.

Given attributed the gains to the achievement in the past six months of "planning, control and operational improvements which have produced a reduction in losses and an indication of a profitable operation."

Kelvinator of Puerto Rico Begins Refrigerator Production

Kelvinator of Puerto Rico, Inc., first major appliance manufacturer on the island, has begun pilot production of electric refrigerators. Full-scale production of the 10-cu-ft model will begin after pilot models have been tested for manufacturing quality and performance in tropical weather conditions.

The refrigerator, similar to U.S. models, has been designed with insulation of an improved type to maintain proper

Sears Typewriter Receives Design Award

The Sears Tower Capri portable typewriter recently received an award from the Industrial Designers Institute for "a noteworthy and fresh approach to the design of a product which is mass-produced and nationally distributed in the United States." The team which designed the product consists of Carl W. Sundberg, Montgomery Ferar, Richard W. Figgins and Toshihiko Sakow, all of Sundberg-Ferar, Inc. Products receiving similar awards were the 1961 Lincoln Continental and General Electric's Educational Project Kits.



temperatures in the tropical heat and humidity that prevails on the island. All major components except refrigeration systems will be produced in the local plant after it has reached regular production.

"In addition to producing refrigerators especially designed for the Puerto Rican market," said G. T. Etheridge, vice president of Kelvinator International, "it will serve as a training and proving ground for low-cost, low-volume refrigerator manufacturing which is typical of many countries."

Smith Opens Ontario Plant

The new 14,000 sq ft A. O. Smith International S. A. plant in Stratford, Ontario has been completed and formally dedicated. The company is a subsidiary of the A. O. Smith Corp., Milwaukee.

D. J. O'Connell, president of A. O. Smith International, said that manufacturing operations for the present will center on the company's Burkay commercial water heaters for application in coin-operated laundries, apartment buildings, restaurants, hospitals and other institutions.

Italian Distributor Named For Maytag Commercial Units

An Italian distributor for Maytag commercial laundry equipment has been appointed in line with the company's program to enter the expanding European commercial market on an increasing scale.

Alrom, S.R.L., headquartered in Milan, Italy, is the firm which has been franchised to distribute Maytag coin-operated washers and dryers in that nation. Samuel S. Pappo, secretary of the Italian firm, signed the agreement during a recent tour of the United States, which included an inspection of Maytag's manufacturing facilities in Newton, Iowa.

Alrom is the third European distributor of Maytag commercial equipment to be franchised in recent months.

Universal Match Buys Wittenborg

Universal Match Corp. has concluded negotiations to acquire Wittenborg, Inc., U.S.A. The acquisition gives Universal Match exclusive distribution rights for Wittenborg vending machines through-

TO PAGE 61 →

Speed Queen Builds 5 Millionth Appliance

A special front panel is placed on the 5 millionth Speed Queen appliance at the company's Ripon, Wis., plant. The 53-year-old firm marked the occasion with special community and plant celebrations recently.





A Tinnerman T-Marked Original...

Dual SPEED NUTS® open door to 20% savings on as-assembled cost

Gibson refrigerator door hinges are held in place with new cost-cutting, time-saving twin-type SPEED NUTS. They replace $\frac{3}{16}$ " plate hinge retainers which had to be drilled and tapped for machine screws.

Gibson Refrigerator analysts estimate that special twin-type SPEED NUTS save 14% on the cost of each hinge retainer assembly, 20.5% on the as-assembled cost. Labor is reduced by half. Former problems with cross-threading and stripping are eliminated... SPEED NUTS and A-type screws go together naturally every time—and faster!

The T-mark of quality and dependability identifies the more than 10,000 variations of SPEED NUT brand fasteners. From this unlimited selection come many saving opportunities for you. Ask your Tinnerman representative to arrange for a free FASTENING ANALYSIS of your product. An engineering service that may produce similar savings for you.

You'll find Tinnerman under Fasteners in your SWEET'S Product Design File and in the "Yellow Pages." *Tinnerman Products, Inc., Dept. 12, Box 6688, Cleveland 1, Ohio.*

OTHER T-MARKED SPECIALS



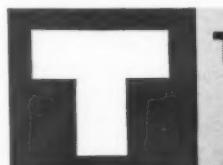
SPECIAL "J" SPEED NUT cuts production time in half for a major gas range manufacturer. Simplified right-angle panel or brace attachments for a variety of appliance, cabinet, and instrument applications. Live-spring tension means a vibration-proof grip.



SNAP-IN FIXTURE FASTENER developed specially for Imperial Lighting Products Co., trimmed 80% off lighting fixture assembly time. Once fastened to the ceramic socket, this unique SPEED NUT snaps quickly into the fixture base...replaces three parts.



PUSH-ON SPEED NUT anchors latching bars on steel desks, reduces material and assembly costs by 50%. Push-on SPEED NUTS can be attached on studs, rivets, or tubing in a split second, and eliminates need for threaded parts... saves time and money.



TINNERMAN
Speed Nuts®
Look for the Tinnerman "T"

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PERMA-GRIP® Handles

**distinctive convenient
standard production prices**

Twelve standard models are offered and six standard patterns are available on any model handle. All handles have plastic spaces which serve as a thermo-break. If you wish, consult with our engineering department regarding special custom requirements.

We have the skilled personnel, the specialized equipment, and we use the right materials to assure a reliable source for quality PERMA-GRIP handles. Let our specialized production line serve as a part of your sub-assembly facilities.



This range produced by the Danby Appliance Corporation is attractively designed to incorporate PERMA-GRIP handles and a PERMA-VIEW window, another engineered product of Mills Products, Inc.

James B. Miller, president of the Danby Appliance Corporation, says:

"We are very pleased with the PERMA-VIEW windows and PERMA-GRIP handles which we utilize on our ranges. The flexibility of size and ease of mounting are especially gratifying features. We heartily endorse the quality and service of Mills Products, Inc."

MILLS PRODUCTS
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Reliability's taken for granted—the greatest compliment you can pay any product.

Royal McBee Installs 2 Meaker Automatic Plating Machines to Process Over 150 Royal Portable Typewriter Parts

Much of the taken-for-granted reliability for which ROYAL PORTABLE TYPEWRITERS are famous is due to the precision plating of over 150 components done on 2 MEAKER AUTOMATIC PLATING MACHINES. One unit takes care of the entire production requirements for chrome plating — plus an equal amount of nickel plated parts. The second MEAKER plates over 100 different components in bright or "black" zinc.

Reports Mr. C. H. Farrington, Production Manager of Royal McBee's new "showplace" plant in Springfield, Mo.: "We particularly like the custom designed automatic programming on our MEAKER. We plate nickel and chrome or just nickel on one unit, and either bright or "black" zinc on the other, in any sequence desired."

Since 1899, THE MEAKER COMPANY has designed and built automatic equipment for continuous or batch-type metal finishing for large or limited production requirements. Our experience has shown that many medium size shops can pay for a MEAKER AUTOMATIC in labor savings and consistent quality production alone.

Our latest catalog "WHEN TO AUTOMATE" will give you some valuable ideas on improving your profits picture through automatic metal finishing or plating.



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"Don't worry, ma'am..."

it's coated with

ACROPON®

It's not the first time this new washer and dryer have been threatened with rough treatment. They've been man-handled from the time they came off the assembly line.

But tough ACROPON kept them safe from scratches, chips and scuffs then... and will continue to protect them for years to come.

ACROPON finish by DeSoto—the outstanding thermosetting acrylic—brings lasting beauty to any appliance. Minimizes freight handling claims because rough handling can't hurt it.

Ask our field engineers to show you how ACROPON outperforms, outlasts any other finish.

DeSoto Chemical Coatings, Inc.

1350 S. Kostner Ave., Chicago 23, Ill.

Circle No. 311 on Reader Service Card.

Industry news

→ FROM PAGE 56

out North America as well as exclusive rights for the assembly and manufacture of the line in North America.

A recent Wittenborg installation in Stockholm is 100 ft long with 1515 compartments, 492 of them refrigerated.

Holly-General to Expand

The acquisition of additional property adjacent to its plant and plans for adding 100,000 sq ft of factory space to its present facility have been announced by Holly-General Div. of The Siegler Corp. The company manufactures heating and air conditioning equipment.

According to R. K. Miller, Holly-General president, sales of the company's equipment are running 50 percent ahead of last year's sales.

Gas Appliance Manufacturers See Improved Second Half

A survey conducted by Edward R. Martin, director of marketing and statistics for the Gas Appliance Manufacturers Association, indicates that builders of gas appliances expect sales of their equipment in the second half of 1961 to exceed the first half by 18.5 percent. The survey also showed that second half sales are expected to exceed first half totals by 1.2 percent.

According to the report, the current consensus among the manufacturers is that sales of gas appliances in 1962 will be up 3.7 percent over 1961. Sales increases are expected for all gas appliances and equipment except gas floor furnaces. This decrease, however, is expected to be offset by increased sales of gas-fired vented recessed wall heaters.

GE Offers Dealer Identification

A 12 by 18-in. steel sign to help identify dealers who handle genuine General Electric renewal parts is now available from the company's Parts Distribution Center, New Concord, Ohio.

The bright red, white and blue sign may be used with a self-contained easel on a counter or wall-mounted with screws. "The sign emphasizes the importance of using genuine GE renewal parts on GE appliances and TV receivers," said T. J. Killeen, manager of the Parts Distribution Center.

Record Attendance Expected At 23rd PEI Shop Forum

Record attendance is expected at the 23rd Porcelain Enamel Institute Shop Practice Forum scheduled for November 1-3 at Ohio State University, Columbus. According to Forum Committee Chairman C. J. Kleinhans, "Advanced Porcelain Enameling" will be the theme of the three-day meeting.

More than 30 papers will be presented to describe the latest developments in porcelain enameling plant operations. One of the Forum features will be a symposium on one-coat, direct-on enameling with emphasis on actual production experience.

Automatic Washer Sales Up

A six percent increase in factory sales of automatic washers for May of this year as compared with May 1960 has been reported by Guenther Baumgart, president of the American Home Laundry Manufacturers' Association.

Automatic washer sales in May of 187,010 units were 14 percent above the

"Petro-Portable" Gas Station Erected in 48 Hours



This "Petro-Portable" gas station was recently erected 120 miles from its construction site — the steel fabrication plant of Continental Copper and Steel Industries' Welin Davit and Boat Div. in Perth Amboy, N. J. The completed station was operational 48 hours after truck arrival. The 192-sq-ft steel sales office, with all electrical and plumbing fixtures and lines installed and awaiting connection to central sources, arrives intact — except for plate glass windows. From seven to nine tons of steel are used in construction of the stations.

Problem:

RUST

During Production

Answer:

magnus

"Rusting occurred when parts were left overnight in our tumbling barrel. Then our Magnus Man prescribed a burnishing soap which did a better job and also licked the rust problem." A Machinery Parts Manufacturer.

"We needed a long term indoor rust and stain preventive which would not 'cloud up' and would not dry hard. Magnafilm 120 filled the bill." A Hardware Tool Manufacturer.

"Our rust control system was the best, yet rust was wrecking our production. The Magnus Man tracked our problem to a bent float valve stem which was over-diluting the rust preventive in our spray washer." An Auto Parts Manufacturer.

"Had been using a rust preventive after machining which required removal before painting. The Magnus Man cut costs, time and labor with an effective rust preventive which requires no removal." A Machine Tool Manufacturer.

FREE
RUST CONTROL DATA FILE

Send for this new data file covering all modern methods of work-in-process rust prevention, or request a copy from your local Magnus Rust Control Specialist.

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Please send FREE Rust Control Data File.

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To sell
to
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of
APPLIANCES

and fabricated metal products

Measure the
Market!

MPM's giant market consists of over 4,700 plants, with a total 1960 production of more than 233 million units—100 million appliances. All appliance plants in the U.S. and Canada, plus over 2,700 producers of similar fabricated metal products, are covered by the 15,000-plus circulation of MPM.

Pinpoint the
Prospects!

MPM's complete coverage of appliance and fabricated metal products plants is selectively directed to people who count—top management, sales management, purchasing, design, engineering, and key plant management and supervision.

Make sure
of Impact!

MPM's superior editorial brings advertisers' sales messages into sharp focus. Superior in quality—researched, written and edited by the most experienced staff in the field. Superior in quantity, too, with far more editorial than either of the other appliance publications.

For over 17 years, MPM has been producing measurable sales results for its advertisers. Today, as the effective, economical medium, MPM is more than ever your basic advertising buy. Write for complete Media File.



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164,481 units sold in April. This brought total automatic washer sales for the year to only six percent less than for the comparable 1960 period, whereas earlier this year they had been as much as 13 percent lower.

Combination washer-dryer sales also showed a gain in May, increasing nine percent over May 1960 and 20 percent over April 1961. Wringer washer sales were up 35 percent over April of this year.

Total factory unit sales of all home laundry appliances during May, Baumgart reported, totalled 301,075 units, down only two percent from May 1960, and up 14 percent from April 1961.

**Speed Queen to Market
Coin-Op Dry Cleaners**

Speed Queen Div. of McGraw-Edison Co. has announced it will enter the coin-operated dry cleaning field with its own unit in September.

The Speed Queen dry cleaner will be offered in banks of four units, each unit being 30 in. wide, 29 in. deep and 68 in. high. Each will clean an 8 lb. load of clothes in 45 minutes using standard perchlorethylene solvents.

Features of the new units include a tubular filter with a 1000 gph capacity, a heavy-duty separately driven pump, an individually powered refrigeration unit, low-density elements, a thermostatically controlled air heater, and a large-capacity storage tank.

GAMA report preceding page last line first paragraph should read "... second half sales are expected to exceed second half 1960 totals by 1.2 percent."

M & T Awards Dishwashers

Three portable dishwashers were awarded to design engineers at the recent Design Engineering Show in Detroit. The dishwashers, by General Electric, RCA Whirlpool and Westinghouse, all feature interior linings of spray-on vinyl plastisol supplied by Metal & Thermite Corp.

Winners of the dishwashers were: D. C. Carlson, Ford Motor Co.; R. G. Neuman, Robotron Corp.; and W. A. Williamson, Clark Equipment Co.

Porcelain Enamel Group to Meet

Committee C-22 on porcelain enamel of the American Society for Testing Materials will meet September 11-12 at the Sheraton-Cleveland Hotel, Cleveland.

Officers of Committee C-22 are William N. Harrison, National Bureau of Standards, chairman; Professor Dwight G. Bennett, University of Illinois, first vice chairman; E. E. Howe, Chicago Vitreous Corp., second vice chairman; and Dr. G. H. Spencer-Strong, Pemco Corp., secretary.

Regional Exhibits Planned for Laundry, Cleaning Equipment

President Carl S. Hulen of the Laundry and Cleaners Allied Trades Association has announced the formation of a subsidiary known as the Laundry and Cleaners Allied Trades Exhibit Corp., the officers and directors of which have been elected from officials of the LCATA.

The new organization, known as LACATEC, plans to sponsor regional in-

Porcelain Enamel Curtainwall for College Dormitories



Six new dormitory buildings at the Connecticut College for Women in New London, Conn., are being sheathed in some 15,000 sq ft of multi-colored architectural porcelain enameled steel spandrels, copings and trim. Artist's conception of complete project is shown above. According to Seaporal Metals, Inc., producer of the panels, the buildings are covered by 11,000 sq ft of "Seaporal" curtainwall.

are you one **?** of the
many **?** plants
who are **?** already using
CV500-T

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TITANIUM **WHITE**

Desirable for
Direct-On as
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WITH YOUR
CHICAGO VITREOUS
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HE'LL SHOW YOU
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THAT'S 10 WAYS BETTER

1. unheard-of color stability* over firing range
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4. incomparable re-fire stability
5. spot sprayability with no visible color change
6. excellent sulphate pit resistance
7. fires at low temperature
8. low stress
9. meets nema white color
10. excellent workability

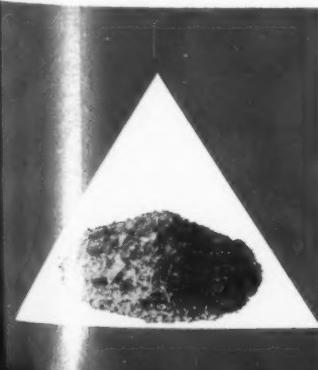
Desirable for Direct-On as well as for Conventional Enameling

*Patent Pending

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Chicago Vitreous CORPORATION

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dustry exhibits which will appeal to the users of commercial laundry and dry-cleaning equipment, supplies, services, and affiliated lines. Exhibits will be planned to interest plant owners and operators of laundries and drycleaning plants, power, neighborhood and coin-ops, business opportunity buyers and others who operate a phase of the business as part of a larger business.

LACATA has recommended that industry exhibits be reduced in size, so that they can be moved around the country, and so that a greater number of plant owners and operators can see them conveniently at a minimum expenditure of time and money.

The first of LACATEC's regional exhibits is scheduled for the Cleveland Public Auditorium, Cleveland, Ohio, on September 29-30 and October 1, 1961. Sponsors say that industry developments require, more than ever before, sufficient time to see first-hand and personally examine improved and new products, services and technical developments. It is announced that there will be no business meetings, and that any user of equipment, supplies, and services is invited. There are no requirements or registration fees for attendance.

Thermoelectricity Powers Radio

A portable thermoelectric generator capable of powering a transistor radio from the heat of kerosene flame has been developed by Minnesota Mining and Manufacturing Co.

Designed for use as a simple emergency power source, the generator is being offered for civil defense use, pri-



New thermoelectric generator using kerosene flame as its heat source provides the power necessary to operate transistor radios.

marily for operating radio sets in home fallout shelters. The generator could also be used in the event of power failures caused by tornadoes, ice storms, or other natural disasters, and in remote areas where electrical power is not available or battery supplies are limited.

Called the 3M brand Aztec generator, it replaces batteries for operating transistor radios, providing a power source that can be stored for long periods of time without deteriorating or causing corrosion.

Heat from the flame of an ordinary kerosene lamp wick acts on six hermetically sealed thermocouples in the unit to produce low voltage, high electrical power. The generator develops approximately .75 volts and delivers $\frac{1}{2}$ watt of electrical power to its load. A built-in transistorized converter changes the .75 volt output to the 3 to 9 volts required to operate most transistor radios ordinarily powered by batteries.

Johnson Bronze Acquires Ferro Powdered Metals

Johnson Bronze Co., New Castle, Pa., has announced that it has acquired ownership of Ferro Powdered Metals, Inc., Salem, Ind. Johnson Bronze, founded in 1901, manufactures sleeve bearings and bushings, bronze bars, engine bearings and powdered metal bushings for parts. Ferro Powdered Metals produces engineered powder metallurgy structural parts and shapes.

TO PAGE 84 →

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INTO THIS-**

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AND MONEY!
WITH
fasten-PAK
PACKAGING SERVICE**

Here is what fasten-PAK does for you!
fasten-PAK packaging eliminates chance of error over hand count or weight methods. In one operation Mid-Continent supplies your fasteners, then with fasten-PAK packages your fasteners by counting, filling, sealing, and prints copy identifying any of the parts contained in each package. Bags can be obtained in either translucent or kraft opaque materials. Remember . . . your savings will be doubled when you buy your fasteners from Mid-Continent. Investigate today . . . you'll be glad you did!

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Our modern plant has the latest mechanical foundry equipment including Osborn Blo-Flex equipment and shell core producing machines.

Production know how, experience and controls assure a quality casting to customer specifications.

Our plant is strategically located in the central South.

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MPM

new industrial literature

SELECTING SPRAY CLEANERS

"Wyandotte Products for Spray Cleaning" is the title of a six-page folder that covers one-operation cleaning and phosphating, simultaneous cleaning and rust-proofing, heavy-duty cleaning without foaming, and aluminum cleaning without etching. Included is a detailed enumeration of the principal factors to be considered in setting up spray cleaning operations.

Circle No. 114 on Reader Service Card.

IRON PHOSPHATE COATING

A colorful, 4-page folder details how Pre-Fos, a product of J. B. Ford Div., Wyandotte Chemicals Corp., prevents rusting of in-process steel parts, and prepares metals for paint by depositing a fine-grained corrosion-resistant iron phosphate coating which saves paint and provides good impact resistance. Used either as a spray cleaner or soak cleaner, Pre-Fos is said to simplify processing by cleaning and phosphating in a single operation.

Circle No. 115 on Reader Service Card.

SNAP-ACTION APPLIANCE SWITCH

A low-cost snap-action switch designed for manual or mechanical operation of vending machines, refrigerators and other appliances has been introduced by Minneapolis-Honeywell's Micro Switch division. It requires less than one cu. in. of behind-panel space. Rated at 10 amperes at 250 volts ac, $\frac{1}{4}$ horsepower at 125 volts ac, the switch, designated IDMI, carries UL and Canadian Standards Association listings. Single-pole double-throw contact arrangement is standard; single-pole single-throw optional. Write for data sheet 191.

Circle No. 116 on Reader Service Card.

MOLDED AND EXTRUDED PARTS

New advancements in transfer molding, transfer splicing, and extruding products of special interest in the appliance, automotive and construction industries are described in a 16-page illustrated brochure published by Geauga Industries Co.

A variety of one-piece dual durometer (hard-soft) transfer molded parts is featured; also shown are parts produced by the company's new dual-compound extrusion process featuring ozone-resistant Hypalon veneers for tubing and profile extrusion seals. The catalog also shows Geauga's development of semi-rigid vinyl extruded trim and rubber extruded over rigid metal for electrical insulation.

Circle No. 117 on Reader Service Card.

THIN WALL REFRIGERATORS

A complete research report, presented before the American Society of Heating, Refrigeration and Air Conditioning Engineers, in Chicago, by Severn Joyce, manager of Owens-Corning Fiberglas Corp.'s

appliance and equipment sales, covers a detailed study of the possibilities for decreased wall thickness in refrigerators.

It was determined that a refrigerator wall theoretically could be designed as thin as 1.3 in. Joyce maintains that a manufacturer can save up to 40 percent of insulating costs for absolute minimum wall thickness by using air-filled fibrous glass. Savings of up to \$12 per refrigerator cabinet are indicated.

Copies of the test report, plus charts and graphs, are available.

Circle No. 118 on Reader Service Card.

AIRLESS SPRAY EQUIPMENT

A complete catalog of all airless spray equipment furnished by The DeVilbiss Co. is now available.

The catalog lists specifications and information on the new medium production pump for single-gun operation, including available accessories, the heavy duty pump for multiple-gun operation, including portable and tank-mounted models, spray guns, including pole and automatic guns, the range of spray caps available, and types of hose and connections.

Circle No. 119 on Reader Service Card.

THREAD-CUTTING SCREWS

A 6-page catalog, describing and illustrating three new thread-cutting screws, is available from Parker-Kalon, division of General American Transportation Corp. The literature gives complete information on design, sizes, material applications, recommended hole sizes, and drill size and minimum penetration in blind holes for the three new thread-cutting screws. Numerous photographs, isometric and artist's drawings, and tables and charts illustrate the material.

Circle No. 120 on Reader Service Card.

PRESS MODERNIZATION BROCHURE

Three different approaches to power press modernization are presented in an 8-page brochure published by Fawick Airflex Div., Fawick Corp.

Bulletin ML-200, entitled "Press Modernization," compares economic and engineering advantages of power press conversions incorporating Fawick Airflex clutches and brakes, through (1) complete engineering of new press drive systems, (2) combining new power transmission units with reconditioned components, or (3) adding new power transmission components to existing drive systems.

Circle No. 121 on Reader Service Card.

ROLL AND STRIP FEED

A new approach to roll and strip feeding of stock by Ferguson Machine Co. combines dynamically controlled stock with the inherent accuracy of roller gear drive indexing to achieve precision feeding at rates over 3,000 in. per minute. Strokes up to 6 in. are available with the standard roll feed. Others can be provided with modifications of the design. Variations in length of feed are achieved through an exchange of rolls with other diameters.

Circle No. 122 on Reader Service Card.

For further information on
New Industrial Literature,
use Reader Service Card
on pages 71 & 72.

THREADED FASTENERS

A 4-page folder describing methods of increasing the efficiency of threaded fasteners has just been published by Skidmore-Welhelm Mfg. Co. The literature discusses the relationship between applied torque and resultant clamping force in fasteners, and explains why torque readings, in themselves, are not reliable measures of fastener holding power.

Circle No. 123 on Reader Service Card.

ELECTRICAL CONTACTS AND ASSEMBLIES

Latest techniques in the use and production of electrical contacts and contact assemblies are described in a technical journal being introduced by the Electrical Contacts and Specialties Div., Fansteel Metallurgical Corp. The periodical, called Fansteel Contacts, will be published bimonthly. It will describe electrical contacts made of tungsten, precious metals and special alloys. These contacts are used in electrical relays, contactors and switch points for industrial, commercial and military controls, and in high-voltage electrical switchgear.

Circle No. 124 on Reader Service Card.

STAINLESS STEEL SCREWS

A new high-strength stainless steel socket head cap screw family is reviewed in a 4-page technical bulletin from Standard Pressed Steel Co. It gives both specification and performance data for the Unbrako KS 812, rated at an increased tensile strength of 125,000 psi minimum at room temperature, and for a wide temperature range of application from minus 300 F to plus 800 F.

A table of typical mechanical properties gives tensile, yield and shear strength, fatigue endurance and stress relaxation values for various temperatures ranging from minus 60 to plus 800 F.

Circle No. 125 on Reader Service Card.

CATALOG ON MATCH-MATED CONTROLS

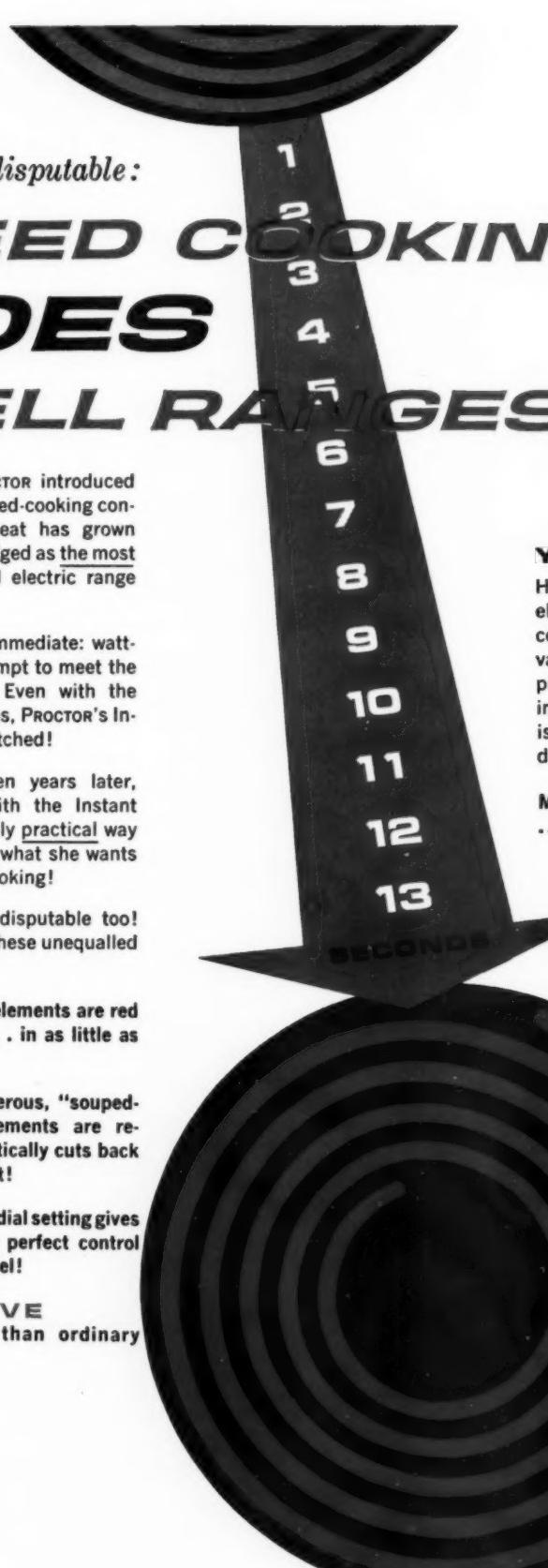
A line of thermostats and thermal time delay relays is covered in Condensed Catalog 61, offered by George Ulanet Co. Robotemp stepless heat control, in 3 models, is an "on-off" pulsator which proportions electric power at line voltage to an electrically heated device. Series FM cartridge thermostats and thermal controls are also covered.

Circle No. 126 on Reader Service Card.

GUIDE FOR LOCK WASHER SELECTION

"How To Select The Right Lock Washer To Meet Job Requirements" is the title of a new booklet produced by Shakeproof, Division of Illinois Tool Works, that describes the various types of lock washers and when to use them. This fact-filled, 12-

TO PAGE 68 →



the facts are indisputable:

SPEED COOKING DOES SELL RANGES!!!

Since 1950, when PROCTOR introduced the Flasher, the first speed-cooking control, interest in fast heat has grown until it is now acknowledged as the most important feature to all electric range buyers.

Industry reaction was immediate: wattages climbed in an attempt to meet the challenge of PROCTOR. Even with the highest possible wattages, PROCTOR's Instant Heat is still unmatched!

Yes, even today, eleven years later, PROCTOR still leads, with the Instant Heat Control . . . the only practical way of giving the housewife what she wants . . . fast, dependable cooking!

And these facts are indisputable too! Only Proctor provides these unequalled advantages:

F A S T—heating elements are red hot . . . and cooking . . . in as little as 13 seconds!

S A F E—no dangerous, "souped-up", high wattage elements are required; wattage automatically cuts back when the element is hot!

S I M P L E—one dial setting gives . . . instant heat, then perfect control . . . at any desired level!

I N E X P E N S I V E—costs little more than ordinary switches!

YET THERE IS MORE

Heating is uniform over the entire element . . . input is automatically compensated for ambient temperature variations and voltage changes . . . pilot light circuits are included . . . installations are easier . . . mounting is simple and adaptable to all range designs.

Make your range appeal indisputable . . . add a Proctor Instant Heat Control.

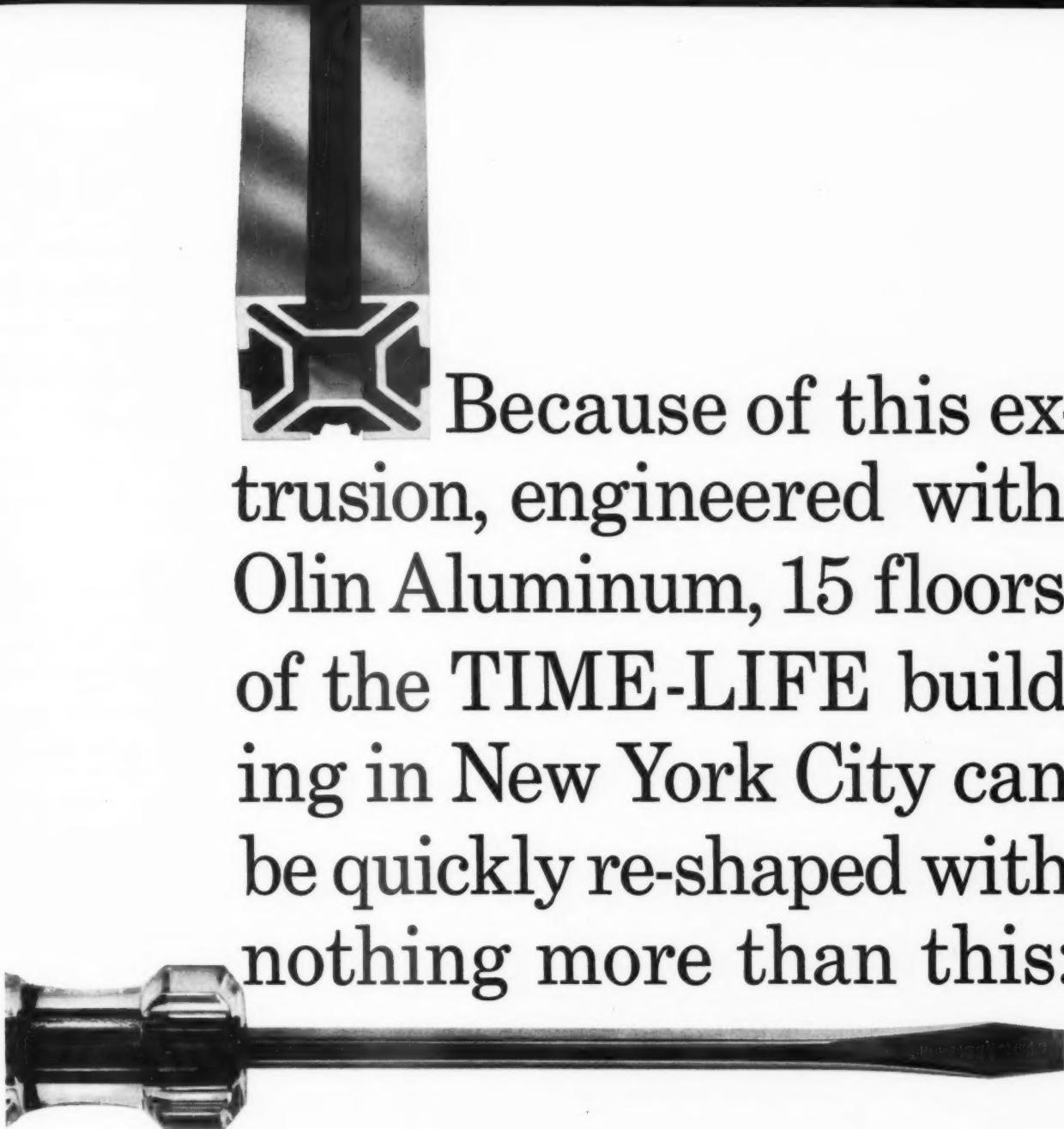


PROCTOR-SILEX CORPORATION

Controls Division
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Baltimore 29, Md.

PROCTOR

Circle No. 346 on Reader Service Card.



Because of this extrusion, engineered with Olin Aluminum, 15 floors of the TIME-LIFE building in New York City can be quickly re-shaped with nothing more than this:

Olin engineers helped design this unique extrusion to serve as the universal junction of movable wall panels. The genius of this extrusion makes it possible to change office size, shape and color in jig time with nothing more than a screwdriver! So many Olin ideas like this have saved so much time and money for fabricators, design-

ers and architects that modesty forbids telling all. As versatile as aluminum is, it doesn't think, doesn't create designs, or doesn't fabricate itself. That's why Olin Aluminum offers you the services of its marketing and technical staff. They "think aluminum." Don't you think it would be a good idea to call Olin?

Olin
ALUMINUM
400 PARK AVE., NEW YORK 22, NEW YORK

Circle No. 343 on Reader Service Card.

New literature

→ FROM PAGE 65

page brochure highlights the particular advantages of each type of standard lock washer plus special stampings. It also lists the types of applications for which each is best suited and why. Included are photographs and cross sectional drawings illustrating typical applications. Of special interest is a consolidated lock washer application index with data on all lock washers tabulated for quick, easy comparison and cross reference.

Circle No. 127 on Reader Service Card.

HANDBOOK FOR DESIGNERS, BUYERS

Intended to assist both the design engineer and the buyer of spring components, a comprehensive new "spring handbook" has been published by The Timms Spring Co. Fully illustrated with a wide range of samples from actual production, the brochure discusses the features of precision springs of every possible type, from simple compression, extension and torsion springs to Belleville, wave and finger-type washers. Four-slide parts (both round and flat wire forms) and non-ferrous specialties are also covered.

Circle No. 128 on Reader Service Card.

BOOKLET ON STUD WELDING SYSTEMS

A booklet offered by Omark Industries, Inc. describes the Omark-Graham stud welding system, which is the "stored en-

ergy" method of welding studs to metal. It combines the advantages of both resistance and arc welding to produce stud welding that neither mars nor distorts thin metal. The method will not harm the reverse side of plated, painted, enameled, ceramic or plastic coated surfaces.

Circle No. 129 on Reader Service Card.

AUTOMATIC POLISHING MACHINE

A 4-page bulletin illustrating and describing the new Model S-101 Automatic Polishing Machine is available from Yates-American Machine Co. The high production machine, especially designed to produce precision controlled finishes on sheet-type materials, utilizes a wheel-drum abrasive impregnated nylon. The oscillating wheel-drum is positioned directly over the work, and is adjusted for abrasive-to-stock contact or quickly removed for changing grade or renewing the abrasive. Feed rates are infinitely variable from 20 to 60 fpm.

Circle No. 130 on Reader Service Card.

PNEUMATIC CLUTCH AND BRAKE

Bulletin No. 52300, in color, illustrates and describes a new Warco pneumatic clutch and brake. Known as Type M-Unit, it is used for crankshaft mounting, and where space is limited or for conversion units where it is desirable to have overhung flywheel drive.

The bulletin is available from Federal-Warco Div., The McKay Machine Co.

Circle No. 131 on Reader Service Card.

PRODUCTS FOR ELECTROPLATING

A sectionized 6-page folder, F-2810, "Wyandotte Products for Electroplating," discusses electrocleaning, spray cleaning, soak cleaning, buffing compound removal and removal of rust from precision parts. Emphasis is placed in fitting cleaning products to the job. Featured Wyandotte electrocleaners include Maxamp for steel, Lectrite Z for zinc die castings, Lectrite NF for brass, and B.N. for all-purpose electrocleaning.

The bulletin is offered by J. B. Ford Div., Wyandotte Chemicals Corp.

Circle No. 132 on Reader Service Card.

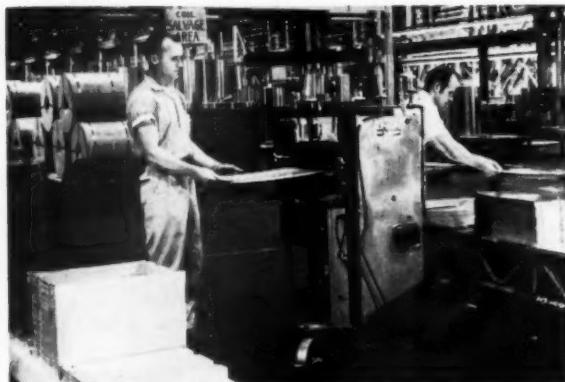
DECIMAL EQUIVALENT CHART

A decimal equivalent chart, designed for quick conversion of Birmingham wire gages and fractions to decimals, is now available upon request from Ohio Seamless Tube Div., Copperweld Steel Co. The chart, printed in color on coated heavyweight card stock, measures 11 in. by 14 in. and is suitable for convenient desktop or wall locations. Birmingham wire gages from 36 to 1 and fractions from 1/64 in. to 63/64 in. are shown in a combination color-position code to facilitate rapid identification.

Circle No. 133 on Reader Service Card.

35 WAYS TO REDUCE SHIPPING COSTS

Fully 35 specific ways to reduce the big bite taken by transportation costs out of the sales dollar are digested in a new booklet entitled "35 Ways To Reduce Your Ship-



Union Roller Coater applies drawing compounds at KAISER ALUMINUM

At the Ravenswood Works, Kaiser Aluminum & Chemical Corporation, Ravenswood, West Virginia, a Union 26" No. 5 Roller Coater gives top performance coating sheet aluminum prior to drawing. *Union Roller Coaters are at work everywhere*, applying drawing compounds, adhesives, paint . . . any fluid substance . . . to metal, plastic, wood, rubber, paper, fabric. Models to handle sheets from 6" to 108" wide, variable thicknesses, coating one or both sides, either or both edges, continuously or intermittently, automatically. What's your coating problem? Write today!

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THE
UNION TOOL CORPORATION
WARSAW, INDIANA

Circle No. 358 on Reader Service Card.

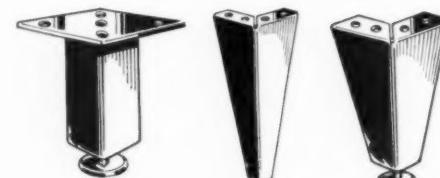
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These legs are only a few of the many Heavy Duty Legs designed and manufactured by Wilkenson for Vending Machines, Appliances, Store and Restaurant Fixtures, Kitchen Cabinets, Metal Desks, etc.

Unlike similar legs on the market, these legs are so rugged that they withstand far greater stress and impact than they will ever receive in normal use. Quality-built throughout, they are available in a large variety of sizes and finishes.

WRITE TODAY for further information about our Heavy Duty Legs.



WILKENSON MFG. CO.

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Circle No. 362 on Reader Service Card.

ping Costs," just published by the Institute for Business Research, Inc. Among the many concrete, cost-saving suggestions included in the booklet are some which, while obvious to the traffic management pro, are overlooked by thousands of other shippers.

Copies are available at \$1 each, with special prices for quantity orders.

Circle No. 134 on Reader Service Card.

UNITIZED TOOLING

A catalog describing Tool Products Corp.'s line of Unitized Tooling is now off the press. The brochure supplies full price and technical information on the firm's line of standard and "oddball" shapes.

Circle No. 135 on Reader Service Card.

STRIP TERMINALS

Bulletin T4-21, 4-page 2-color, lists The Thomas & Betts Co.'s line of insulated Sta-Kon strip terminals, including ring, rectangular, spade and flanged spade types, and the attaching machine used in conjunction with them. The machine is said to be of rugged construction and provides high speed production of consistently uniform attachment. Wire terminations are said to be tight for life. The reel of terminals is quickly mounted on the machine and easily fed into the die head.

Circle No. 136 on Reader Service Card.

STEEL CONTAINER LININGS

A 49-page Test Chart Manual offered by Bradley & Vrooman is designed to help steel container users, manufacturers and reconditioners select proper protective linings by telling "what lining holds what for how long." Thirty-nine pages of test results, listing the holding qualities of the firm's Sterilkote linings for hundreds of different products, are included in the manual.

Circle No. 137 on Reader Service Card.

HIGH FREQUENCY ELECTRIC TOOLS

A new 32-page catalog on high frequency electric tools has been issued by Thor Power Tool Co. The No. 62 catalog covers the company's complete line of high frequency tools including grinders, sanders, polishers, impact wrenches, screwdrivers, nutsetters, drills, reamers and balancers. Forepart of the catalog presents an analysis of high frequency tools with a capsulated report on the advantages of using 180, 360 or 400-cycle tools for specific job applications.

Circle No. 138 on Reader Service Card.

TAILORED TOOLING

Tailored Tooling is the title of a new 8-page Bulletin B-600 issued by Kennametal Inc. The booklet shows how to use a new line of Kendex standardized adjustable units with "throw-away" inserts in multiple-insert and special tools designed for specific jobs. Many tools that have been designed and fabricated with these units are illustrated. Features, mounting methods and complete specifications of the units are given.

Circle No. 139 on Reader Service Card.

Wedgewood-Holly Sees Business Upturn

FROM AN MPM
DICTET REPORT

THE WEDGEWOOD-HOLLY CORP., Culver City, Calif., formerly produced gas ranges only, both free-standing and built-in models. The company has recently introduced a line of electric built-in ovens and drop-in units.

While this company sells a high percentage of its ranges on the West Coast and concentrates in Arizona, California and Nevada, it has distributors throughout the Southwest as far south and east as Florida and distributorships in New York, New Jersey and Chicago.

Neil T. Reeves, vice president of Wedgewood-Holly, reports that, starting the first of March, there was a distinct uptrend in the sale of the company's ranges, and he feels that this is a trend that will continue. As a result, the plant is working full time.

The company is running approximately 40 percent built-in and 60 percent free-standing. A great deal of the firm's current effort is behind a comparatively new line of "semi built-ins" designed for the builder market. **MPM**

Wedgewood-Holly's vice president Reeves is shown with the "Karefree Kook center," in matching walnut cabinets. Another new product is the Mark IV 36-in. free-standing range used as a built-in to fit flush with countertops.



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THE MAGIC BOX



To a child, a vending machine is a colorful box which magically brings forth candy bars or milk when she feeds it her treasured coins. To knowledgeable businessmen everywhere, broadening their vending vision, vending machines are becoming the magic boxes which bring forth new selling opportunities...and a share in a \$2.5 billion market. NRI coin handling mechanisms make vending possible. NRI Currency Changers make vending grow.



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Circle No. 341 on Reader Service Card.

Reader Service

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METAL-CASED SWITCHES

A new Unimax catalog gives complete details on the new horsepower-rated KL series of heavy-duty metal-cased switches, and the double-break type BK-1 switch. Convenient pictorial index shows location of dimension drawings, descriptions, force and movement specifications, electrical rating, and a photo of each switch listed.

Circle No. 101 on Reader Service Card.

DRAWER SLIDES

A catalog covering Grant Pulley & Hardware Corp.'s wide range of slides is available. The brochure contains extensive data covering types, load ratings and installation instructions, and includes ball bearing, roller bearing and friction-type slides, their construction and advantages. The catalog should be helpful to those engaged in the design, purchasing and production of appliances utilizing drawers and similar sliding units.

Circle No. 102 on Reader Service Card.

COMPLETELY ANODIZED DECORATIVE TRIM

A brochure describing Anodyne, Inc.'s line of completely anodized aluminum decorative trim is now available. The material comes in ten designs, and is available embossed, pre-formed or cut-to-shape. The trim is said to be corrosion, rust and stain-resistant, and the pressure sensitive adhesive backing makes it easy to apply.

Circle No. 103 on Reader Service Card.

PAINT STRIPPING PROCESS

A brochure explaining the Kolene No. 5 Process of chemical paint stripping is available from Kolene Corp. Both the process, and equipment used in the process of paint stripping, are covered.

Chemically, Kolene No. 5 is a hygroscopic alkali base, catalyzed to accelerate and control the chemical oxidizing properties of the bath. Any hooks, fixtures, or parts that are not adversely affected by temperatures above 800 F can be processed in Kolene No. 5.

Circle No. 104 on Reader Service Card.

BRONZE CASE FOR GUIDE, PISTON RODS

A 2-page, 2-color bulletin describing Bronze Case for guide rods and piston rods is available from Thomson Industries, Inc. In combination with hardened steel bushings, the material is shown to increase life of these working parts tenfold, according to the company. The bulletin lists money-saving advantages, specifications and sizes.

Circle No. 105 on Reader Service Card.

BROCHURE ON NOISE CONTROL TECHNIQUES

A technical brochure from Owens-Corning Fiberglas Corp. outlines effective approaches to solving acoustical problems in appliances and equipment.

Both absorption of airborne noise and reduction of structurally-borne sound are explained. The information is documented with details of test methods used to arrive at basic data presented for maximum quiet-

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116	132	148	164	180	196	212	228	244	260	316	332	348	364	380	396	412	428	444	460

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What article in this issue interested you most? _____

Any other comment? _____

ing. The book, "Appliance and Equipment Quieting Materials," is illustrated with performance tables, nomographs, drawings and photographs.

The brochure can guide engineers towards the source of sound trouble and suggest practical and economical solutions using existing Fiberglas products.

Circle No. 106 on Reader Service Card.

COLOR CODING ENAMELS

A color card of color coding enamels, available from Reynolds Ink, Inc., has actual chips of the 18 colors of new, fast drying, spray-type enamels that are used for color coding inventory stocks and work in process; for identifying piping, electrical connections, fire and water valves, etc.;

directing interplant routing of materials and all other color coding operations.

Circle No. 107 on Reader Service Card.

MICRO-SET GAGING SYSTEM

A gaging system for all Model 15A, 10AA and 10A Strippit Fabricators is described in Catalog MS offered by Wales Strippit Inc. The gaging system consists of a 1½-in. quick change holder with micro-set gaging that allows any operator to make back and end gage settings directly to thousandths in a matter of seconds. The features of the new system are dial indicator assemblies and microbars which are mounted directly to the holder base and the back gage bar.

Circle No. 108 on Reader Service Card.

MORE THAN MEETS THE EYELET

Engineered, high volume contract production of eyelets, drawn shells, and metal stampings for appliance, instrument, electronic and general metalworking manufacturing markets are described in a special information bulletin, "More Than Meets The Eyelet," published by The Cly-Del Mfg. Co. The complete sequence of operations, from blank to finished draw, are shown and described in detail along with a running account of the company's background, growth and future plans. Also included are descriptions of the services offered by the firm, such as engineering and design, tooling, warehousing, special packaging, secondary operations and finishing.

Circle No. 109 on Reader Service Card.

PLATECOIL HEAT TRANSFER BULLETIN

A bulletin issued by the Platecoil Div., Tranter Mfg. Inc., describes the adaptability of Platecoil heat transfer equipment to special applications requirements. Platecoil consists of two metal sheets, embossed and welded together to form passages for heating and cooling media. This equipment can be engineered and built to requirements of shape, size, materials of construction and heating or cooling capacity to satisfy a broad range of process heating and cooling needs.

Circle No. 110 on Reader Service Card.

ENGINE SAFETY CONTROL SYSTEM

A 60-page catalog, offering more complete information on all-pneumatic engine safety control systems than has been previously available, is now available from the Fulton Sylphon Div., Robertshaw-Fulton Controls Co.

Catalog J contains full descriptions of a number of complete systems incorporating safety shutdown or warning upon malfunction of measured variables such as temperatures, pressures, levels, speed, vibration, etc. Individual components such as relays, indicators, receivers, etc. are also fully described.

Circle No. 111 on Reader Service Card.

POLYCARBONATE RESIN

A 4-page folder listing sources of supply for Lexan polycarbonate resin in standard fabricated shapes is available from the Chemical Materials Dept., General Electric Co. Designated CDC-389, the folder lists fabricators, and the sizes of rod, sheet, tube, film and slab available in stock or on order. The booklet also contains a description of the 14 properties of the resin, and data about its use.

Circle No. 112 on Reader Service Card.

MAINTENANCE BOOKLET

A picture booklet, 16 pages, presenting helpful facts about making maintenance and repair parts, has been made available by La Salle Steel Co.

The booklet, entitled "One Way To Make Your Job A Little Easier," should be of particular interest to maintenance executives, engineers and other key maintenance personnel. The booklet offers solutions for those persons faced with the problem of getting machinery repaired and back into production fast . . . and at minimum cost. It will also prove helpful to designers, production and research men who must make any kind of special machinery or equipment requiring machine parts.

Circle No. 113 on Reader Service Card.

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YOURS IN **HOMMEL COVER COATS**

Capture the purity and beauty of a fresh snowfall . . . then endow this smooth, uniform texture with enduring permanence. You have a Hommel Cover Coat . . . a quality-controlled finish embracing both the functional and the decorative.

Put your porcelain enamelling requirements in the hands of Hommel's specialists and be assured of the best in both product and service. You'll find Hommel Cover Coats give broader coverage and more uniform texture . . . with no costly production tie-ups. Available in pure white or brilliant and pastel colors.



**PORCELAIN ENAMEL
FRITS**

Dept. MPM - 861

THE O. HOMMEL CO. PITTSBURGH 30, PA.

West Coast Warehouse, Laboratory and Office, 4747 E. 49th Street, Los Angeles, California

POTTERY • STEEL AND CAST IRON FRIT
CERAMIC COLORS • CHEMICALS • SUPPLIES

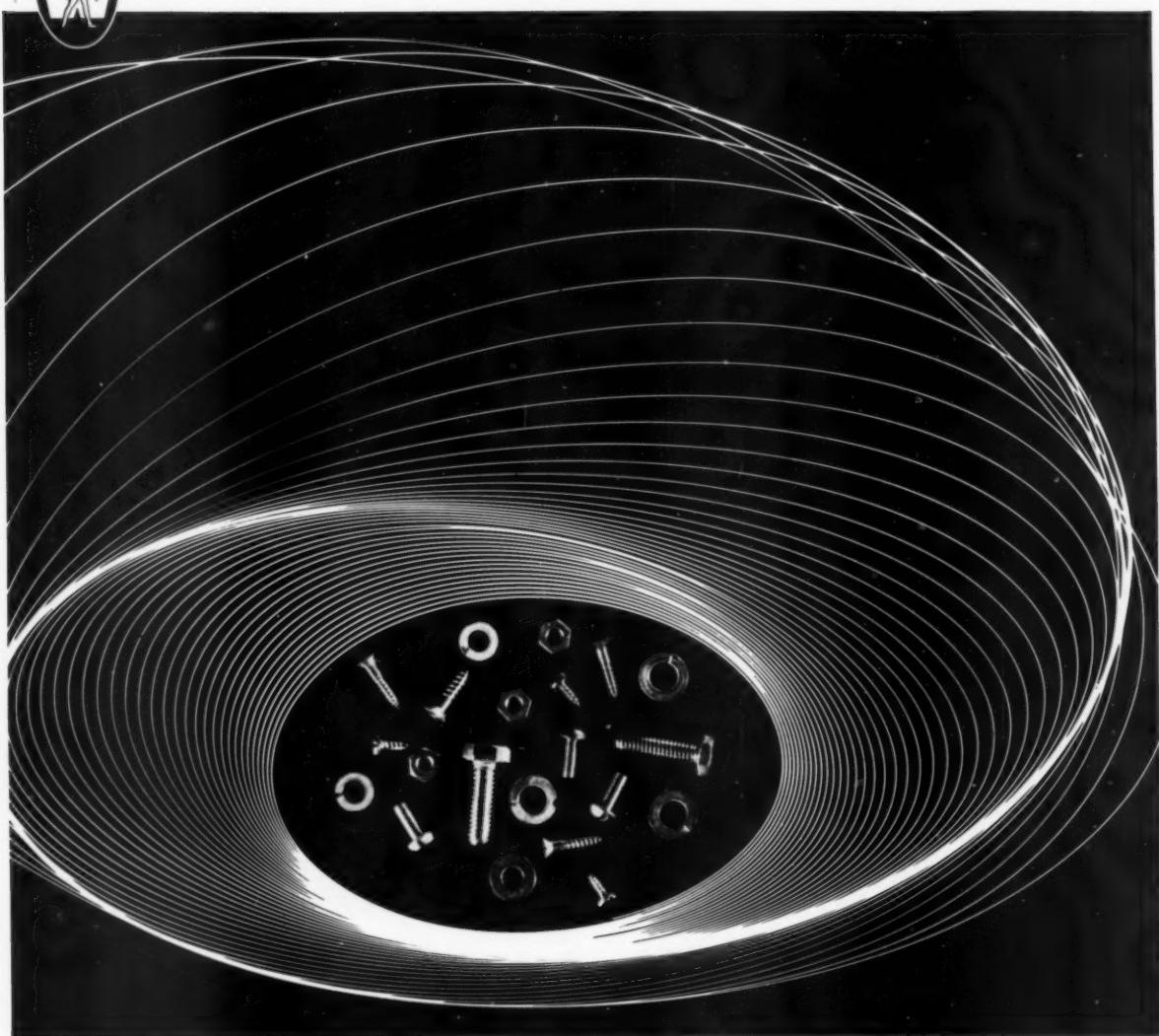
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BARREL CLEANING'S A CINCH WITH NUVAT!

That's because NUVAT rapidly removes soils other heavy-duty cleaners won't touch. NUVAT is normally used hot, but is also effective at temperatures as low as 120°. Rinses freely, even in hard or cold water. NUVAT is formulated so it won't ever form scum—no scum on your parts, no scum on your barrel. NUVAT is wonderful as a regular soak-tank cleaner, too. Let us demonstrate NUVAT soon.

Wyandotte Chemicals

J. B. FORD DIVISION

WYANDOTTE, MICHIGAN • LOS NIETOS, CALIFORNIA • ATLANTA, GEORGIA

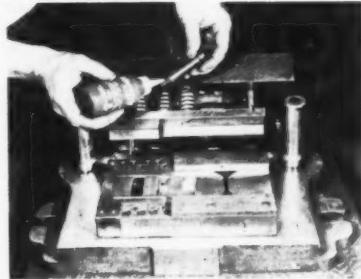
Circle No. 363 on Reader Service Card.

MPM

new supplies and equipment

For further information on
New Supplies and Equipment,
use Reader Service Card
on pages 71 & 72.

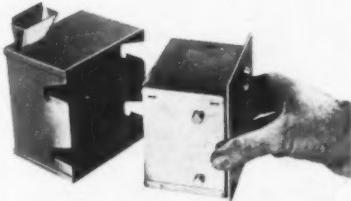
Loctite Sealant



A liquid plastic, called Loctite and manufactured by American Sealants Co., is said to lock cap and shoulder screws in place, holding them secure against all shock and vibration. Use of the sealant method of locking screws allows the user to take full advantage of precision quality heat-treated shoulder screws. No softening of the screws is required to add the locking elements. To apply, parts are cleaned with any shop solvent and allowed to dry. The sealant is applied to either the male or female threads and assembled in the usual manner. The locking action develops after the parts are assembled.

Circle No. 202 on Reader Service Card.

Two-Key Locked Coin System



A locked coin collection system with a program lock requiring two different keys, and adaptive to most vending machines, has been announced by M. H. Rhodes, Inc. Basically, the system consists of two strong, heavy steel coin boxes with a patented lock, keys and a bracket for installation in the vending machine. One key (office) opens the box, and the other key (route man) locks box in machine. The box is said to be tamperproof and eliminates temptation. Route men are furnished locked, empty coin boxes that can be opened only with the office key. Later, the filled boxes are removed simply by a quarter turn of the route key which also seals the coin slot.

Circle No. 203 on Reader Service Card.

MPM AUGUST • 1961

Universal Speedi-Spacer

The Universal Vise and Tool Co. has announced the introduction of a precision spacer called Universal Speedi-Spacer for use on milling, drilling, grinding and other toolroom and production machining operations. The unit features a quick-action actuating lever and a choice of seven different divisions in the standard model. The Speedi-Spacer is available with T-slotted platen, plain platen or chuck. Divisional accuracies of 40 seconds or better are said to be obtainable.

Circle No. 204 on Reader Service Card.

Back-Geared Punch Presses

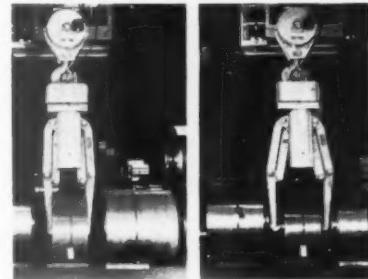


A complete line of back-geared punch presses ranging in capacity from 2 through 25 tons is available from Alva Allen Industries. The line includes six standard models, with other special models available with special die space, etc.

The presses are said to give slow, powerful strokes, resulting in more advantageous applications of flywheel inertia for many operations, and can be easily changed from repeat to non-repeat action. The back-geared press makes it possible for strokes per minute or flywheel revolutions per minute to be reduced as desired without sacrificing loss of press tonnage capacity.

Circle No. 205 on Reader Service Card.

Coil Lifter With Motorized Swivels



Tong action coil lifters with motorized swivels, developed by Cullen-Friestd Co., are designed for handling coils with cores in the horizontal position. One lifter handles a complete range of coil widths. Only the crane operator is required to operate the lifter, which is designed with lifting legs that are in a vertical position at any opening. This permits the crane operator to pick up or set down a coil using a minimum of space, as little as 10 to 12 in. between stacks of coils, regardless of coil width. Motor operation of the lifter and swivel enables the operator to grab, lift, carry and rotate, and set down and release the load quickly and safely.

Circle No. 206 on Reader Service Card.

Automatic Viewer Welding Helmet

Auto-View Welding Helmet Co. has announced a welder's helmet which allows the welder to look at his work without touching his helmet. The unit affords the opportunity for the welder to look through either clear plastic or filtered glass, at will, without removing his hands from his work. His chin does the job. Whenever the welder desires to see his work, he simply opens his mouth. To automatically replace his leak-proof light filter, he closes his mouth. A spring-activated mechanism does the work.

Circle No. 207 on Reader Service Card.

Low Temperature Fluxless Solder



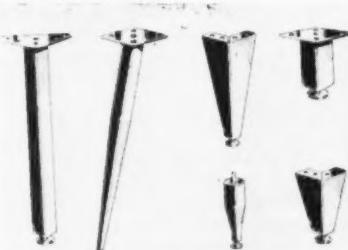
A low temperature fluxless solder, called Tin-A-Lum, which melts at extraordinary low temperature, has been developed for use on aluminum and its alloys, zinc, tin, pewter, magnesium and other metals, as well as castings.

Advantages claimed for the solder are considerably increased joint strength and an absence of any subsequent joint corrosion.

Tin-A-Lum may be applied with a soldering iron or by using indirect heat from an oxyacetylene torch or similar source. Deposits can take a high polish, can be plated, and are said to have satisfactory heat and electrical conductivity.

Circle No. 208 on Reader Service Card.

Heavy Duty Legs



A line of heavy duty legs for vending machines, kitchen cabinets, appliances, store fixtures and similar applications is available from Wilkenson Mfg. Co. The legs are finished in brass, copper, chrome, pewter and stainless steel. Glides permit height adjustments up to 1 in. to assure firm positioning of equipment on any floor.

Circle No. 209 on Reader Service Card.

Reversible, FHP Gearmotors

Instant reversing, high constant torques, low sound level, compact size and a wide range of output speeds (individual speed

TO PAGE 77 →



SERVICE FROM DESIGN TO DELIVERY

Benefit dollar-wise, as well as quality-wise . . . call in Kinkead at the *very beginning* of your design planning. Kinkead's engineering and design people will work with you to plan metal trim to fit your specifications.

Do you have need for extrusions or roll-formed shapes, with supplementary operations such as polishing, bending, notching, anodizing, stud welding or screen painting? Kinkead's superior facilities and experience will pay satisfaction dividends in quality, delivery and economy.

For further information contact:



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Circle No. 325 on Reader Service Card.



COMING FEATURES

GENERAL

★ 15TH ANNUAL HOME LAUNDRY SECTION — SEPTEMBER ★
STANDARDIZATION — CONTINUATION OF A SERIES
MOTOR WHEEL REDUCES SPACE, INCREASES OUTPUT
OF MOBILE HOME OIL HEATERS

DESIGN

WHAT ABOUT DOUBLE INSULATION FOR APPLIANCES?
INSTALLATION FLEXIBILITY HIGHLIGHTS
NEW LINE OF DISHWASHERS

FABRICATION

NEW SHEARING LINE BOOSTS EFFICIENCY
AT GP&F
AUTOMATIC CLOTHES DRYER STAMPINGS PRODUCED
WITH MINIMUM HANDLING

FINISHING

FLOW COATING PORCELAIN ENAMEL
GROUND COAT AT GE
A 68-INCH STRIP COATING LINE

SHORT FEATURES

AN ANSWER TO A CRITICAL BRAZING PROBLEM
PRODUCTION-LINE FABRICATION OF
STAINLESS STEEL "COKE" TANKS



METAL PRODUCTS STATISTICS

		1961 (Units)	1960 (Units)	% Change
Gas Furnaces	May	68,600	66,700	+ 2.8
	Jan.-May	313,300	314,900	- 0.5
Gas Boilers	May	10,920	9,720	+17.8
	Jan.-May	45,545	43,739	+ 4.1
Gas Conversion Burners	May	7,500	7,700	- 2.6
	Jan.-May	30,200	38,600	- 21.8
Oil-Fired Central Heating Equipment	April	39,043	37,704	+ 3.6
	Jan.-Apr.	145,358	152,381	- 4.6
Gas Ranges, Free-Standing	May	126,800	115,500	+ 9.8
	Jan.-May	553,700	635,300	- 12.8
Gas Ranges, Built-In	May	33,300	30,000	+11.0
	Jan.-May	132,800	134,200	- 1.0
Gas Water Heaters	May	215,600	205,500	+ 4.9
	Jan.-May	1,177,000	1,099,300	+ 7.1
Gas Vented Recessed Wall Heaters	May	25,000	25,800	- 3.1
	Jan.-May	125,400	134,400	- 6.7
Gas Floor Furnaces	May	4,500	5,000	- 10.0
	Jan.-May	92,100	26,500	- 16.6
Gas Direct Heating Equipment	May	59,100	69,700	- 25.3
	Jan.-May	258,600	289,500	- 10.7
Gas Unit Heaters & Duct Furnaces	May	9,700	9,900	- 2.0
	Jan.-May	58,800	62,800	- 6.4
Gas Incinerators	May	2,600	4,100	- 36.6
	Jan.-May	16,600	19,800	- 16.2
Electric Household Refrigerators	May	294,300	273,400	+ 7.6
	Jan.-May	1,332,900	1,499,000	- 11.1
Electric Farm & Home Freezers	May	95,000	95,500	- 0.5
	Jan.-May	383,100	451,200	- 15.1
Electric Ranges, Free-Standing	May	69,400	63,800	+ 8.8
	Jan.-May	366,500	376,200	- 2.6
Electric Ranges, Built-In	May	62,200	54,700	+13.4
	Jan.-May	279,200	288,400	- 3.2
Electric Water Heaters	May	55,200	59,200	- 6.8
	Jan.-May	302,300	313,400	- 3.5
Electric Dishwashers	May	45,000	46,600	- 3.4
	Jan.-May	238,700	234,100	+ 2.0
Electric Food Waste Disposers	May	68,000	67,000	+ 1.5
	Jan.-May	311,800	318,800	- 2.2
Dehumidifiers	May	34,500	73,000	- 52.7
	Jan.-May	186,700	220,100	- 15.2
Combination Washer-Dryers	May	10,499	9,589	+ 9.0
	Jan.-May	42,575	70,044	- 39.0
Washers—Automatic & Semi.	May	187,010	176,883	+ 6.0
	Jan.-May	960,340	1,020,782	- 6.0
Washers—Wringer & All Other	May	60,894	67,060	- 9.0
	Jan.-May	259,330	302,829	- 14.0
Electric Dryers	May	27,441	29,465	- 7.0
	Jan.-May	234,068	270,145	- 13.0
Gas Dryers	May	15,231	24,235	- 37.0
	Jan.-May	121,237	147,363	- 18.0
Metal Furniture	May	*	*	- 13.0
	Jan.-May	*	*	- 20.0
Vacuum Cleaners	May	240,866	265,556	- 9.3
	Jan.-May	1,356,315	1,436,678	- 5.6
Typewriters	Jan.-May	428,604	*	*
Room Air Conditioners	April	195,700	226,900	- 13.7
	Jan.-Apr.	724,300	668,400	+ 8.4
Unitary Air Conditioners (1)	Jan.-Mar.	77,551	62,856	+23.0
Steel Barrels & Drums	April	2,541,532	2,481,742	+ 2.4
	Jan.-Apr.	9,936,989	9,689,122	+ 2.6
Steel Pails	April	6,517,124	5,919,732	+10.1
	Jan.-Apr.	23,724,861	23,758,460	- 0.1

(1) Including heat pumps

* Not reported

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

New Supplies

→ FROM PAGE 75

from 3 to 500 rpm) is provided in two new gearmotors manufactured by New England Gear Works, Inc.

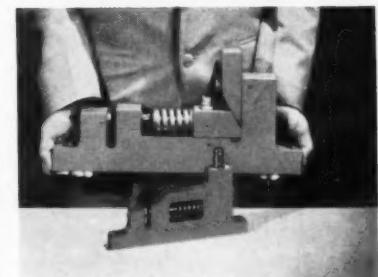
These units develop up to 250 in/lb at 10 rpm, and are available in 1/15 hp, 220 volt, 3 phase and 1/15 hp, 115 volt single



phase. Ball bearing equipped motors are combined with a heavy duty gear head, which utilizes carbo-nitrided, special cut alloy steel-generated gears and pinions to provide long life. These units are said to be ideally suited for vending and business machines, automation equipment, conveyors and many other OEM and industrial applications.

Circle No. 210 on Reader Service Card.

Horizontal Hole Punching Units



Announcement of a complete line of Uni-punch Series "HZ" horizontal hole punching units has been made by Punch Products Corp. The units are designed for punching round and shaped holes in flanges of angles and other formed parts. The punch in this type unit travels horizontally and the button-type die, stripper spring, lifter spring and guide are located in a horizontal position in the holder. Nothing is attached to the press ram. The holder of these completely self-contained units perfectly aligns the punches and dies.

Circle No. 211 on Reader Service Card.

Ball Mill Lining Brick

A new high-density brick for ball mills is said to eliminate end lining failures. Manufactured by Coors Porcelain Co., the brick have matching grooves that form a continuous channel the full length of each end row. A steel bar is placed the full length of each channel, forming a durable structure of cement, steel and brick. In addition, the reinforcing rods are tied to the end lining with steel clips spaced at regular intervals.

According to Coors, this design prevents the possibility of the end lining coming loose and collapsing in the charge, a prob-

Use the exclusive GRIPCO® CLINCH NUT

for "fixed" fastening or
"hard to reach" assemblies

For positive attaching of a threaded medium to thin metals. They are clinched solid for a rigid application, or staked in with a six point staking punch for a floating effect. Available with or without self-locking threads. Gripco Clinch Nuts can be clinched or staked with hydraulic or air equipment. Full details available—write for samples and NEW CATALOG today, or consult the yellow pages in your phone book under "GRIPCO" for the representative nearest you.



WITH GRIPCO FASTENERS YOU GET:

Service — 40 Sales representatives all over the country for prompt, fast service.

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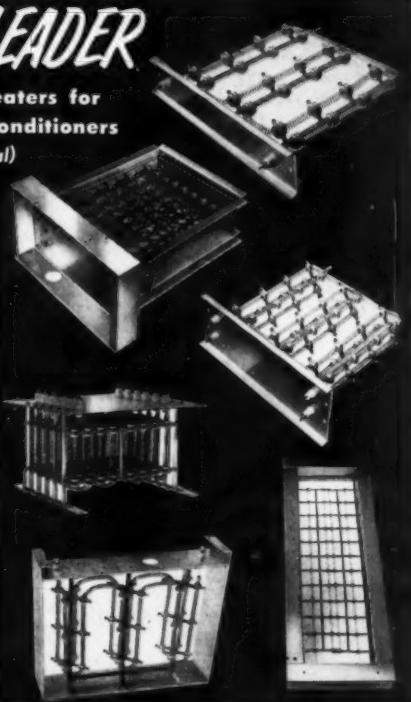
Circle No. 320 on Reader Service Card.

How to be the LEADER

In Building Supplementary Heaters for
Heat Pumps and Window Air Conditioners
(Both Residential and Commercial)

Always Be Years-Ahead In Design, Quality and Service

Rugged, efficient TEP Heating Units are used as supplementary heat source for heat pumps or as heat source for forced-air heating equipment. Designed to meet your own specifications, the coils may be used individually or in any combination desired.



Specify TEP "Open Coil" Heating Elements —
FOR LONG SERVICE LIFE AND LOW MAINTENANCE

- Floating frames that eliminate rigidly welded construction and permit elements "to breathe."
- Exclusive insulator and cross-bar design is an original research development, patented by TEP.

Cross-section of patented TEP insulator and cross-bar. More space for air circulation assures better heat dissipation, longer wire life.
Patent No. 2921173

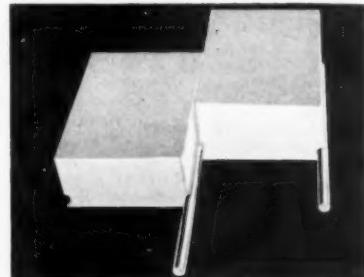


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MANUFACTURERS OF OPEN COIL HEATING ELEMENTS, SWITCHES, CONTROLS
Circle No. 356 on Reader Service Card.

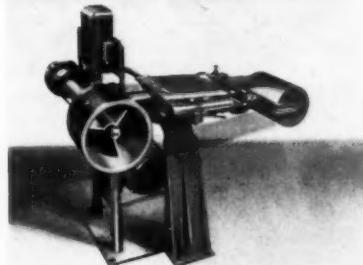
lem which is sometimes caused by flexing of the mill end or penetration of liquids which destroy the bond between brick and metal. The reinforcing bars tie the end



brick rows together and to the peripheral brick of the end lining. The metal clips, fastened to the mill end, hold the reinforcing bars at the points necessary to supplement the usually weak bond of cement to metal.

Circle No. 212 on Reader Service Card.

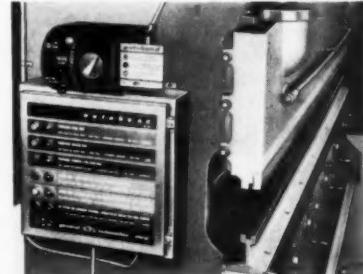
Belt-Tracking Stand



A backstand, designed for positive belt tracking under heavy work pressures, is being offered by Murray-Way Corp. The unit is said to be ideal for deburring, surfacing, squaring, grinding and polishing, and may be driven by a lathe wheel or any other powered wheel. It employs an idler roll and a special "air eye" which prevents belt runoffs. When heavy work pressures act to move the belt to one side or the other, the "air eye" signals the idler roll which automatically corrects the position of the belt.

Circle No. 213 on Reader Service Card.

Press Brake Pushbutton Control



Pushbutton control on all press brakes is now possible with Autobend, a new production control offered by General Automation Corp. The unit is said to automatically eliminate whipping and assure uniform bending. It automatically cycles the brake and provides the correct bending speed.

(More in next column) →

Main features are: pushbutton programming for every type of production and custom work; automatic whipless and uniform bending; stepless speed control from a small fraction to 100 percent, permitting peaking to the maximum bending speed that the work will allow; easier handling of long and troublesome pieces; and two-operator control of any operation, when desired.

Circle No. 214 on Reader Service Card.

"Gourmet Cooking" Oven Control

A new gas oven control described as "the most revolutionary advance in gas range cooking in the past 25 years," has been introduced by The Wilcoker Co.

According to the company, the control allows the homemaker to put a frozen roast or casserole into the oven, set the controls for a fast or slow defrost, followed by cooking at the proper temperature. Another unique feature is a "gourmet fan" which "walks" (cools quickly to maintain peak degree of doneness) the roast.

Other features of the control include indicators which show when the pilot is out, when the oven is on, when it is ready, and when it is warming; 100 percent shut-off of the pilot; elimination of tubes or fittings to the thermostat; elimination of the solenoid; no time lag in thermal response; and no re-ignition of the burner.

Circle No. 215 on Reader Service Card.

Universal Sequence Timer



A new universal sequence timer for dishwashers, automatic clothes washers and combination washer-dryers has been introduced by General Electric. The timer is said to give increased reliability and flexibility over previous models.

A crank drive mechanism requires the motor to deliver only the amount of torque needed during a particular pulse rather than the continuous high torque required by other commonly used drive mechanisms. Extended motor life is expected to result.

Other features of the new timer include a specially designed T-1 Telechron motor, a cam stack made up of individually molded phenolic wafers, single-pole, single-throw switches, one-piece construction of the switch assembly that eliminates current-carrying rivets, and built-in provisions for sub interval switching.

The sequence timer is available in nine different pulse intervals from 30 to 180 seconds, and in a choice of pulses up to 72 per cycle. Additional variations can be supplied for special applications.

Circle No. 216 on Reader Service Card.

MEN AUGUST • 1961

You have already saved the cost of receiving inspections when **KLIXON** Thermostats are shipped!

Receiving inspection procedures are time-consuming and costly. Customers familiar with the rigid quality controls applied to KLIXON Appliance Thermostats before this *certified quality* label is attached have eliminated receiving inspections as far as our controls are concerned. Duplicate copies of our regular production quality control records are enclosed in each certified shipment . . . assuring that each piece therein is as indicated on the records. Your occasional QC check on sample pieces from the shipment will verify the certification. More and more blue chip customers request their controls on this basis, at no extra cost, and profit from **QUALITY YOU CAN COUNT ON!**

METALS & CONTROLS INC.
5908 N. MAIN STREET • VERSAILLES, KENTUCKY
A CORPORATE DIVISION OF
TEXAS INSTRUMENTS INCORPORATED

Circle No. 337 on Reader Service Card.

MEMO

TO - All spray phosphating engineers
SUBJECT - Precleaning eliminated

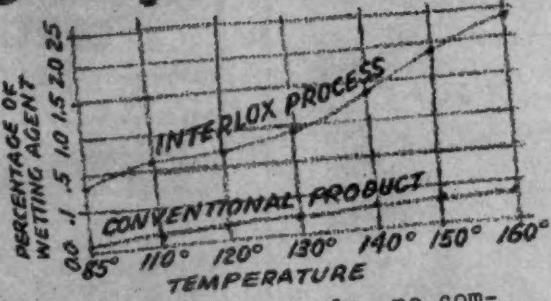
Northwest's Interlox Spray Process now assures high efficiency phosphate coatings, without precleaning, even at low temperatures.

The Interlox Spray Process has proved its superiority through more than three years of research, two years of field testing, in over 100 production installations on everything from auto parts and metal furniture to lighting fixtures and scientific instruments.

A PROCESS-not just a product!

CHECK THESE ADVANTAGES

- ✓ No alkali carry-over.
- ✓ Lower maintenance costs.
- ✓ No loose coating, (white powder or smut).
- ✓ Lower operating temperatures.
- ✓ Fewer plugged nozzles.
- ✓ Less hard scale.
- ✓ No flash rusting.
- ✓ Better smut removal.
- ✓ Less control time required.
- ✓ Complete removal of oxidized oils.



The method is simple, no complicated controls or expensive ingredients. A specially developed neutral cleaner is added DIRECTLY to the phosphate bath in whatever proportion is indicated by requirements. Maximum wetting without foam, a fine-grained phosphate deposit is the result.

Northwest's consulting engineers will gladly survey your operation and submit recommendations. No obligation.

Licensed Manufacturers: ALERT SUPPLY CO. Los Angeles, Calif. • ARMALITE COMPANY, LTD. Toronto, Canada

NORTHWEST CHEMICAL COMPANY

310 RIVERSIDE • DETROIT 4, MICHIGAN

GENERAL SALES & ENGINEERING • CONSTRUCTION CORPORATION

Circle No. 342 on Reader Service Card.





MPM

personals

Harry Shubart has been named director of manufacturing for the **Benjamin Div., Thomas Industries**, Des Plaines, Ill., manufacturer of commercial, industrial and residential lighting fixtures. Shubart was chief engineer with the Emil J. Paidar Co. before joining Benjamin.

Kenneth M. Lord has been elected vice president-manufacturing and purchasing for **Raytheon Co.** He was formerly general manager of the Military Products Div., General Dynamics Electronics.

Hugo N. Grayden has been named technical director for the industrial finishes division of **The O'Brien Corp.**

Daniel A. Porco and **Eugene A. March** have been elected vice presidents of **Crucible Steel Co. of America**. Porco was formerly assistant to the president, and March, who becomes vice president of technology, was director of technology.

Charles W. Baker has been appointed assistant to the president of **National Screw & Mfg. Co.**, Cleveland. In his 49th year with the company, he has served as director of technical sales and research for the past 11 years. W. William Lawrence succeeds him in this post.

John R. Branstrator has been appointed applications engineer of the **OMC Engines & Equipment Div., Outboard Marine Corp.** He will work in the OMC Engines corporate headquarters in Waukegan, Ill. Prior to his recent appointment, he was a field service engineer for Outboard Marines Corp.

Raymond F. Koch has been elected vice president of **Comptometer Corp.**, Chicago. Koch, who has been secretary of the corporation since 1957, will hold the title of vice president and secretary. He joined the company in 1946 as an apprentice toolmaker.



EDGAR



SANDNESS



WILSON



FETZER

Fred H. Edgar has been named division vice chairman-aluminum sales of the **Metals Div., Olin Mathieson Chemical Corp.** He had been serving as director of aluminum extrusion operations. He joined Olin in 1957 as regional sales manager in Detroit.

Arnold C. Sandness has been promoted to the position of manager of advertising and marketing of **Delco Products Div., General Motors Corp.** The assignment includes responsibility for the division's advertising, merchandising, sales promotion, market studies and sales forecasting. He joined the company in 1954.

A. L. Topp has been appointed assistant general manager and **Jack S. Huber** has been named director of sales of the Heating and Air Conditioning Div. of **Controls Co. of America**.

Caloric Appliance Corp. has promoted **Harold Tiley** to manager-LP gas sales and has named **Merle Weiss** to Tiley's previous position as manager of Caloric's Mid-Atlantic sales division.

Lawrence Incandela has been appointed national sales manager of home freezers for **Norge**. He has been in the freezer business more than 15 years. In his new position he will be responsible for the marketing of Norge freezers nationally.

C. J. Callanan has joined **Rheem Mfg. Co.'s Home Products Group** as national product manager, plumbing fixtures. He has been employed by American Radiator and Standard Sanitary Corp. since 1951 in a variety of sales, marketing and executive positions.

Marvin P. Wilson has been named manager of sales operations for **Kelvinator**. Formerly comptroller for the company, he will now supervise profit performance, expense and inventory control and other operations in the sales organization.

Rod E. Fetzer has joined **Geo. D. Roper Sales Corp.** as director of product planning. He is in charge of free-standing and built-in development and design. Before joining Roper, he served as Western manager for The Tappan Co.

Robert Voltmann has been appointed product development manager by **MacDermid, Inc.**, manufacturer of metal cleaning, plating and finishing chemicals. He had been assigned to the company's research laboratory in the Waterbury, Conn. plant.

Three **Ranco, Inc.** engineers have been appointed to new positions. **John Leibermann** has been named chief engineer, **Thomas Syfert** was appointed project manager, and **Lewis Eggert** becomes assistant project manager.

William F. Oswalt has been elected executive vice president of **The Stanley Works**, New Britain, Conn., and **Edward M. Haines** has been elected vice president, engineering. As executive vice president, Oswalt fills the post vacated by **Howard L. Richardson**, who was elected president recently. Haines will be responsible for the company's manufacturing engineering and product development activities.

Robert A. Orr has been appointed assistant to President George Romney of **American Motors Corp.** Orr has been

BRANSTRATOR



KOCH



INCANDELA



CALLANAN



HAINES



ORR



FERRO RESEARCH PAYS OFF FOR YOU

**Better products . . . Better processes . . . Better controls
...for Better Porcelain enameling at lower applied costs**

Serving our customers' needs is Ferro's principal business. That's why we maintain modern production facilities close by our customers' plants and an extensive field organization—both unmatched in size or quality in this or most other comparable industries. But Ferro's service to customers goes much further, and it is in these other areas customers gain their greatest benefits. *Ferro's research*, for instance!

Looking for thinner, lower cost porcelain finishes? Or for some that fire at lower temperatures so cheaper steels can be used? Or for protective coatings more resistant to acids, alkalies and minerals (for water heater tanks, mufflers, silos etc.)? All are available, worthy successors to the frits you are now using first pioneered and perfected by Ferro.

Looking for more stable and uniform porcelain enamel colors? And for help in matching porcelain to organic finishes? *Ferro has what you need* right now; the result of research facilitated

by the most modern scientific equipment.

Looking for still better or lower cost ways to prepare metals for porcelain enameling? Or new mill additives, or perhaps mill formulas, to make some tricky new application work? Or again, for improved or lower cost means of applying the enamel slip to your products? *Ferro has many of these answers now*; also knows what won't work, but is ever seeking new solutions.

Looking for new firing techniques? Or for ways to save fuel and/or labor costs in this part of your manufacturing? *Ferro's research has produced answers here, too*—answers confirmed by application to actual production lines.

From basic research on raw materials through to devising improved quality controls for use in our customers' plants, Ferro strives constantly to improve your products, your processes, your production output and your profits. Are you fully utilizing these services? They're yours free, included in the cost of our products.



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EIKENBERG



MERTLER



MATTICKS

an executive of General Electric for the past 10 years as manager of its Vacuum Cleaner Div.

William F. Harris has been named to the new post of product reliability service manager for **The Wilcolator Co.** His responsibility will be to determine that customers are satisfied with the quality and performance of controls sold by the company.

John H. Eikenberg has been elected president of **Revere Copper and Brass, Inc.**, and a member of its executive committee. Also, **William T. Bertier** has been elected vice president and general manufacturing manager. Eikenberg joined the company in 1924, and has been a vice president since 1945. Bertier has been with the company since 1929,

has been chief engineer since 1953, and in 1957 was also appointed assistant general manufacturing manager.

R. I. Hahn, president and director of Walker Co., has been named to the board of directors of the **Modine Mfg. Co.** He has been president of Walker since 1956. Also, **W. R. McMahon** was elected to the position of vice president, engineering.

Charles S. Mertler has been named engineering vice president of **Stevens Mfg. Co.** He has been chief engineer at Stevens since 1950.

Kenneth A. Matticks has been appointed product manager, stainless flat products, by **Crucible Steel Co. of America**. He will be responsible for sales promotion of stainless steel sheet,

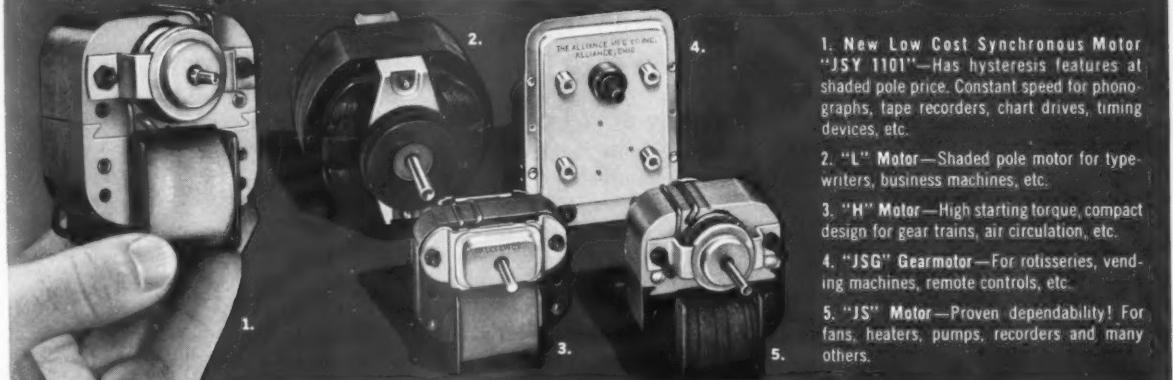
strip and plate for new and existing applications. He was formerly manager-technical services.

Joseph C. Lowey has been named manager of the Metal Industries Div. of **The Diversey Corp.** He will be responsible for developing markets and expanding sales of the company's chemical cleaners and surface preparation compounds used by the metals industries.

Joseph F. Krepley has been appointed director — extrusion operations of the Metals Div. of **Olin Mathieson Chemical Corp.**, it was announced by Milton L. Herzog, corporate vice president and general manager of the division.

John M. Richardson has assumed a newly created manager of marketing position at **A. O. Smith Corp.'s** electric

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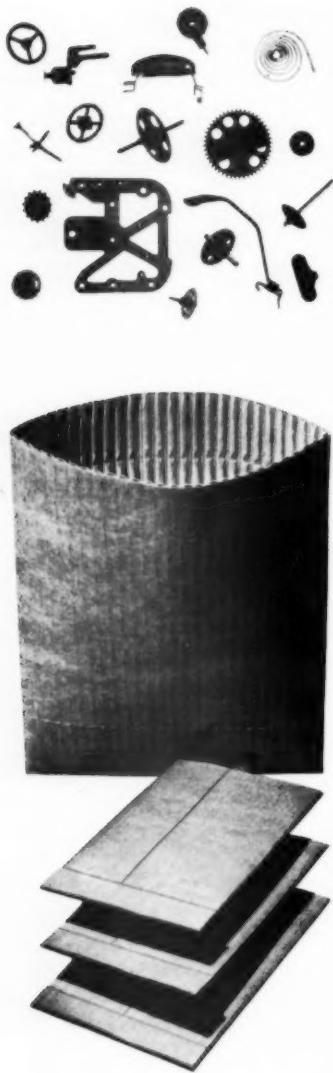
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(Subsidiary of Consolidated Electronics Industries Corp.)

Model	Voltage	Starting		Full Load			Weight
		Torque oz./in.	Torque oz./in.	Speed RPM	Input Amps	Watts	
JSY 1101	117	1.0	0.4 (pull in)	3600	.285	18	1 lb. 14 oz.
L	117	6.5	8.0	3250	1.20	77	3 lb. 7 oz.
H	117	1.0	1.0	2500	.310	17	1 lb. 0 oz.
JSG	117	225	165	12-14	.490	25.5	1 lb. 7 oz.
JS	117	1.75	2.70	2900	.570	29	1 lb. 2 oz.

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motor division. In announcing the appointment, Division General Manager H. O. Alken said Richardson has been delegated overall authority for marketing all product lines of the electric motor division, including fractional, integral, and hermetic motors, as well as special products.

C. M. Hargraves, manager of the Industrial Equipment Div. of the **R. C. Mahon Co.**, has been appointed a vice president. He has been with the company for more than 30 years, serving in various technical, management, sales and administrative positions.

Frank B. Knight has been appointed vice president and **G. Edward Ammerman** general sales manager of **Chromalox, Inc.**, a subsidiary of Edwin L. Wiegand Co. Knight, who joined Chromalox three years ago as general manager, now assumes a more direct responsibility for all company operations. Ammerman has been associated with the company for the past seven years, and will now direct sales activities in connection with all Chromalox electric heating products.

Industry news

→ FROM PAGE 64

The powder metallurgy parts division of Johnson Bronze Co. will be relocated and combined with Ferro at Salem. An enlargement of plant facilities at Salem is being undertaken to accommodate this joint operation.

Robertshaw Buys Lux Clock

Stockholders of the Lux Clock Mfg. Co., Inc., recently voted to approve a plan of reorganization which provides for the sale of their company to Robertshaw-Fulton Controls Co., Richmond, Va. The Lux organization will operate under present Lux management as the Lux Time Div., Robertshaw-Fulton.

Robertshaw has completed research and development on three new systems of automatic time programming. Lux will manufacture the timing device portion of these systems.

Norge's Sayre Sees Appliances Topping 1960 Sales

Judson S. Sayre, Norge chairman, has predicted that 1961 sales of major home appliances will top last year's total.

Sayre, speaking at a news conference at the recent Home Furnishings Market in Chicago, said "industry inventories of both automatic washers and refrigerators stand at 150,000 units less than at this time in 1960, with orders running a bit better. Pricing is relatively stable."

Another highlight of the press conference was the introduction of Norge's line of 1962 automatic washers. Top feature of the line, according to Sayre and



MPM PHOTO

assistant Harold Bull, is that the new models are designed to cut service time by 33 percent.

Design of the new washers permits complete access to the unit without pulling it from the wall. Also, a new motor mount allows complete removal of the motor without the use of tools. Another feature of the motor is that it automatically adjusts belt tensions and motor load for various load requirements.

Also introduced was a new hair dryer accessory, which attaches to Norge automatic clothes dryers. Weighing about 11 lbs., the accessory comes in three parts and snaps over the dryer's clothes port.

Kelvinator's Travis Optimistic About Industry's Future

Citing the general condition of the economy and poor weather as primary reasons for the slow pace of appliance sales in the first half of 1961, Homer Travis, vice president in charge of Kelvinator sales, told a press conference recently that the current year should finish strong and equal last year's performance.

Speaking at a press conference held in conjunction with the summer Home Furnishings Market in Chicago, Travis predicted that consumer spending for durable goods in the fourth quarter of this year would exceed the first quarter by about 20 percent.

Looking farther into the future, Travis said the replacement market for appli-

TO PAGE 88 →



editorial voice of the national safe transit program

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DANA CHASE PUBLICATIONS, INC.

Devoted to improving packaging, shipping, and materials handling methods for the appliance and metal products manufacturing industries. This section contains information on plant experience and industry advances for improving packaging and shipping methods, and prevention of in-transit loss. It also contains information on the National Safe Transit Committee's preshipment testing program and reports on NST activities.

Lease and Rental Finance Plans of Automatic Lift Trucks

Lease and rental finance plans offered by the Automatic Transportation Co. to buyers and users of the company's industrial lift trucks are explained fully in a new 12-page booklet entitled "Which Is Best For You?" The new booklet describes methods that enable the buyer or user to avail himself of the economies of more than 200 models of Automatic lift trucks without impairing existing credit lines, without restrictions on growth and operating efficiency caused by tight money, and without making large capital expenditures.

Radio Control Head

A new trunk-mount two-way radio has been added to the Transistorized Progress Line of vehicular communications equipment manufactured by the General



Electric Co. A new control head half the size of previous control units has been designed for use on a car's dashboard when the basic radio is placed in the trunk. The compact, lightweight design minimizes the space required at the dashboard. The unit has a three-position Off-Standby-On switch, enabling the owner to take advantage of lower battery drain made possible by extensive transistorization. When the switch is on "standby," the radio is ready to receive a call and consumes only .040 amperes from the battery.

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NOM AUGUST • 1961

Cantilever Storage Rack

A new adjustable arm cantilever rack has recently been announced by Jarke Mfg. Co., manufacturers of stock storage systems. Columns are constructed of heavy structural steel welded to formed plate bases, joined by cross and X-bracing to set up stable and rigid units. Keyway slots on the column faces provide 4 in. adjustable spacing for the arms which "button on" with no bolts or nuts required.

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Safe Transit Awards Presented to Trucking Industry Members

Safe Transit awards were presented for the second consecutive year to those members of the trucking industry whose companies won first place in class in the annual John Miller Claim Prevention Contest, sponsored by the National Freight Claim Council of the American Trucking Associations, Inc. Ralph F. Bisbee, president, National Safe Transit Committee, Inc., made the presentation at the council's annual banquet held recently at the Sheraton-Dallas Hotel, Dallas.

Upon recommendation of the NFCC of the ATA, recipients of the awards were chosen in recognition of their leadership

Compact Electric Car for Variety of Industrial Needs

A compact electric car specifically designed for industrial service is now available from Namisco, Inc. The 182-lb., 30-in.-wide car is said to be ideally



adapted for use by plant executives, inspectors, machine repair men, maintenance men, etc. It can also be used for factory, warehouse and stockroom delivery service when operated in conjunction with a trailer that will haul loads up to 250 lbs. The electric car itself will haul the operator and has an integral carrying space for loads up to 100 lbs, or for an additional passenger.

The car is driven by a special 12-volt electric motor that is operated by a foot switch. The lead-acid battery is equipped with a trickle charger.

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Recipients of Safe Transit awards are congratulated by Ralph F. Bisbee, president, NSTC, Inc. From left, they are: R. C. G. Witt, J. L. Bliss, E. L. Roberson, J. L. Boies and Bisbee.



Rowe standardizes on material handling

A MAJOR PRODUCER of automatic merchandising machines is using over 5000 corrugated steel boxes and skids for a program of material handling equipment standardization that affects virtually every plant department and operation.

The company, Rowe Mfg. Co., Inc., a division of Automatic Canteen Corp. of America, has been acquiring these containers and skids over a period of years as operations expand and become more complex. Production at its Whippoorwill, N. J. plant has risen threefold over the past five years, and the product line has been substantially broadened. Added to this is the fact that the company not only assembles machines, but also fabricates most of the parts. Because of this, the need to move and handle material during production has also increased.

Rowe has purchased, to date, approximately 4500 steel boxes and 1000 skids. Concerning the decision to be committed

so extensively to standardized units, Charles S. Bindig, staff industrial engineer, noted: "We believe that uniformity of material handling equipment for every job has given us a flexibility unobtainable with custom or special racks for different purposes."

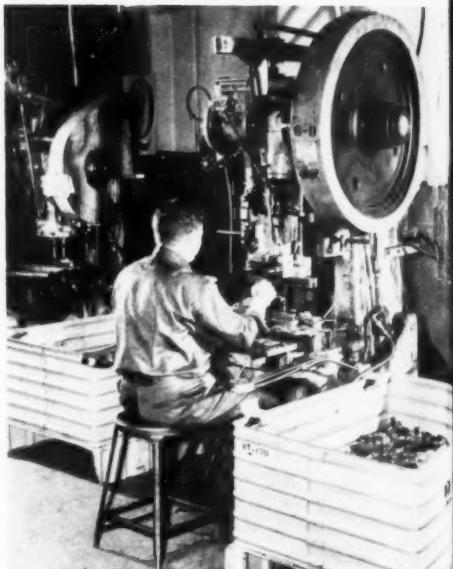
Each plant department — press, welding, plating, painting, sub-assembly and

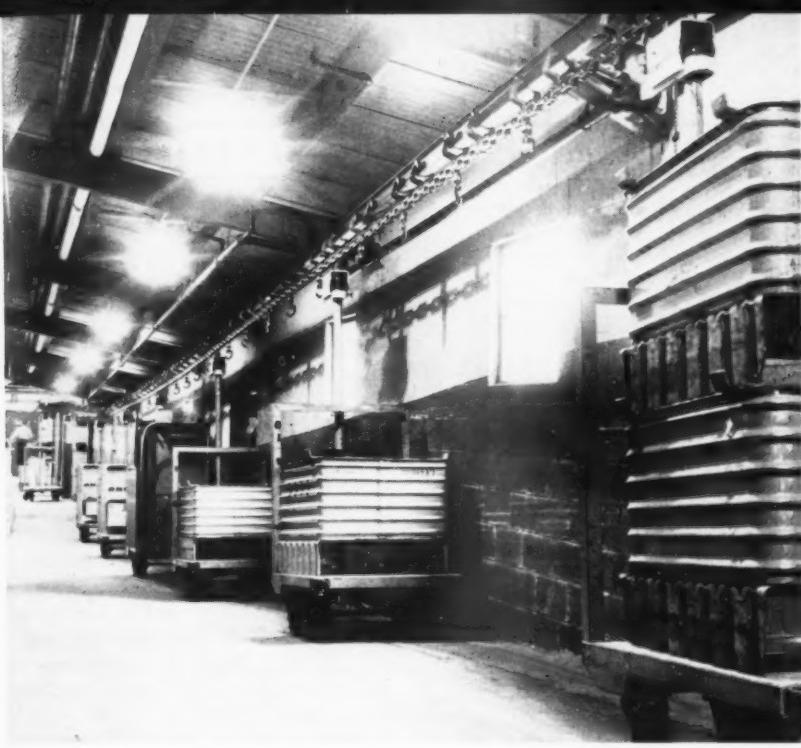
PHOTOS COURTESY REPUBLIC STEEL CORP.'S BERGER DIV.

(Above) — One of Rowe's two main storage areas shows five-high tiering of steel units manufactured by Republic Steel's Berger Div.

(Right, above) — Punch press operator works out of one unit into another. Platform truck will remove box at right when full; replace it with the then-empty one at left. A fresh box of parts will continue the cycle. Boxes have a capacity of 4000 lbs.

(Right) — Spot welder adds brackets to pan taken from rear unit. After welding, the completed assembly is placed in box at left.





(Top photo) — Steel boxes travel from production area to staging area where they, and their parts, will be held until ready for transportation to the next assembly department.

PHOTOS COURTESY REPUBLIC STEEL CORP.'S BERGER DIV.

(Above) — Boxes fitted with special inserts to hold delicate assemblies are shown at the inspection bench in coin mechanism department.

(Right) — Parts await use by assemblers in final assembly department. Units in foreground are 32 in. deep; box at left is 18 in.



final assembly — obtains empty bins or skids as needed from a conveniently located bin storage area. In each instance, the units are used both at the work area and for transport between departments. In the welding shop, for example, a full container of work is positioned on one side of an operator, an empty one on the other. As boxes empty and fill, others are brought in.

In the press room, boxes and skids are used in combination to form work tables which hold steel blanks after shearing. Lift trucks then pick up a loaded skid for transfer to the next operation. A new skid is moved in to take its place.

A particular problem arises in Rowe's coin mechanism assembly department. The coin mechanisms are extremely delicate, and rough handling would affect calibrations. Ordinarily, custom racks would be necessary. Instead, Bindig designed an insert which holds 16 coin assemblies. The insert is loaded, and then set within the container. The unit is then transported by platform truck to a staging area.

The staging area contains 7300 sq ft of space. It is to this area that finished parts or assemblies are sent to await dispersion to the final assembly department for further processing. In the case of coin assemblies, these boxes are taken from the staging area, when needed, and placed aboard carts which are propelled by an overhead tow conveyor system to the final assembly department. Here, the automatic merchandising machines are assembled, given the finishing touches and receive final inspection.

The corrugated steel boxes are also used for parts storage. Rowe maintains two main storage spaces — apart from its floating storage. One has 10,000 sq. ft of space, the other 11,000. Units are stacked five high, back-to-back, to form double rows. MPM

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Industry news

→ FROM PAGE 84

ances sold shortly after World War II and the outlook for home building were promising signs.

Another encouraging note was added by Leonard C. Truesdell, executive vice president of Zenith and president of Zenith Sales Corp. He noted that industry sales of TV sets by distributors to dealers in May were up 15.8 percent over the previous month.

Although he is generally confident about the radio-TV industry's future, Truesdell expressed concern over the matter of price cutting and "low selling."

Arvin Industries Producing Stainless Steel Mufflers

Stainless steel automobile mufflers, designed especially for the replacement market, are being produced by Arvin Industries, Inc., Columbus, Ind.

Arvin engineers report that they have 16 different mufflers as to size, shape and fittings, and that these sizes will fit more than 90 percent of muffler replacements on American-made cars since 1955.

Stainless steel is used in the most corrosive areas in the new muffler, such as shell, outer wrap, two baffles and smaller miscellaneous parts. The mufflers are guaranteed for five years.

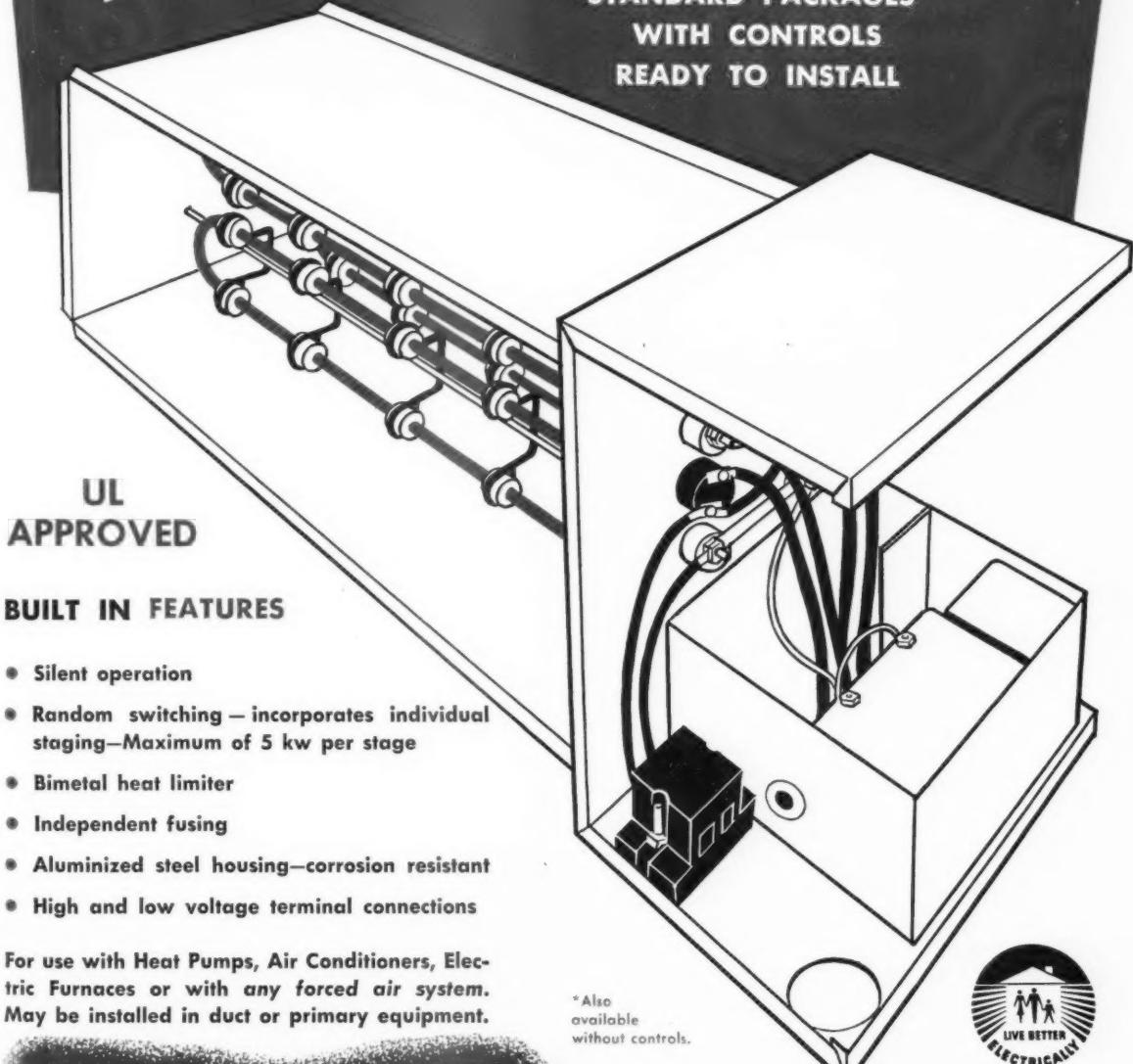


An employee unloads stainless steel mufflers from conveyor and stacks them for shipment.



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1, TYPE S*† adjustable. Positive acting, single stud or nozzle mounting. Operation to 600°F. Rating: 16.6 amps at 115 VAC, 8.3 amps at 230 VAC. Spade, screw or formed terminals, various adjusting stems, etc. Bulletin 1000.

2, TYPE S*† non-adjustable. Is similar both electrically and mechanically to adjustable Type S. Spade or screw type terminals; single stud or nozzle mounting. Bulletin 1000.

3, TYPE SA*† adjustable or non-adjustable. Snap acting, electrically independent bimetal. Also single-pole, double-throw. Rated at 15 to 25 amps at 115-230 VAC only. Spade or screw terminals; single stud or nozzle mounting. Bulletin 2000.

4, TYPE SM† manual reset. Mechanically and electrically same as adjustable and non-adjustable Type SA except for manual reset feature. Bulletin 2000.

5, TYPE A* semi-enclosed. Insulated, electrically independent bimetal disc gives fast response and quick, snap action control. Operation from -50° to 300°F. Lower or higher on special order. Various mountings and terminals. Rating: 4 to 15 amps at 115 VAC and 28 VAC/DC. Bulletin 3000.

6, TYPE A hermetically sealed. Electrically identical to semi-enclosed Type A. Temperatures from -50° to 300°F. Various enclosures and mountings, including brackets, available. For appliance, electronic, apparatus applications. Bulletin 3000-A.

7, TYPE H†. Positive acting, adjustable, for fry pans, skillets and other appliances. Fail-safe, open in low to 500°F in high. Rated at 1650 watts at 115 VAC. Bulletin 10,000.

8, TYPE Ct hermetically sealed or semi-enclosed. Small, positive acting. Electrically independent bimetal strip for operation from -10° to 300°F. Rated approximately 3 amps, depending on application. Various terminals and mountings. Bulletin 5000.

9, TYPE G*. Also available as manual reset. Used on laundry dryers, furnaces and other similar applications. Snap acting. Rated 7½ to 25 amps, 120-240 VAC. UL approved for operation to 300°F. Bulletin 3500.

10, POTTED TYPES A* & G*. For refrigeration, air conditioning, or applications requiring a sealed thermostat, the Types A and G are available with lead wires and epoxy sealed. Type GP is shown. Various mounting brackets. Bulletin 3160 for Type A, Bulletin 3560 for Type G.

11, TYPE W*† adjustable or non-adjustable. Snap action bimetal strip type for operation to 300°F. Depending on duty, rated: 5 to 10 amps, 115 VAC. Screw or nozzle mountings; spade or screw terminals. Bulletin 4000.

12, TYPE Rt sealed, adjustable or non-adjustable. Positive acting for operation to 600°F. Rated at 15 amps at 115 VAC, 4 amps at 230 VAC. Screw terminals. Bulletin 7000.

13, TYPE Mt semi-enclosed. Electrically independent snap acting bimetal disc type for appliance and electronic applications from -50° to 300°F. Rating: 3 to 10 amps at 115 VAC and 28 VAC/DC. Virtually any type terminal. Bulletin 6000.

14, TYPE Mt hermetically sealed. Electrically same as semi-enclosed Type M. Can be furnished with pin or solder-type terminals, wire leads and various mounting brackets. For operation from -50° to 300°F. Bulletin 6000.

15, TYPE MX† semi-enclosed. Snap acting to open on temperature rise. 2° to 6°F differentials available. Rated at 3 amps to 1 amp, depending on duty cycle, at 115 VAC and 28 VAC/DC. Various terminals, mountings, brackets, etc. Bulletin 6100.

16, TYPE MX† hermetically sealed. Snap acting miniature thermostats in circular enclosures or CR-7 cans. For avionic, aerospace, electronic and similar uses. Normal differentials 2° to 6°F; special order 1° to 4°F differentials available. Ratings same as Type MX semi-enclosed. Bulletin 6100.

Illustrations, for general information only, do not necessarily show size comparisons. Fully dimensioned and certified prints on request. Manufacturer reserves right to alter specifications without notice.

*Refer to Guide 400 EO for UL or CSA approved ratings.

†These thermostats covered by patents issued or applied for.

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